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ABSTRACT

The report summarizes the results of a national evaluation of the Emergency School Aid Act (ESAA) Basic and Pilot programs during their third year of operation, 1975-76. It also provides longitudinal data on the achievement of students participating all three years, 1973-74 through 1975-76. Examined were the needs of ESAA students and schools, school expenditures and their relationship to the students' academic needs, ESAA program impact on student achievement, and the relationship between student achievement and certain program characteristics and approaches. Data indicated that: sample students in Pilot and Basic schools showed clear evidence of need for compensatory education programs in reading and mathematics; in general, minority students, whether in minority-isolated or desegregated schools, showed a greater need for compensatory education services than did non-minority students; more than half the total supplemental funds in all three evaluation samples were spent for basic skills instruction; recipient districts and schools translated their ESAA funds into services appropriate for their students, and focused those services most heavily on the students with the greatest academic needs; there was a positive relationship between students' reading achievement and the extent of school activities designed to promote a favorable interracial climate in the Basic Secondary sample, while there was a negative relationship between such activities and student achievement in the Basic Elementary sample. (NQ)

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The Third Year of Emergency School Aid Act (ESAA) Implementation

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EMERGENCY SCHOOL AID ACT (ESAA) IMPLEMENTATION

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OVERVIEW

This report summarizes the results of a national evaluation of the Emergency School Aid Act (ESAA) Basic and Pilot programs during their third year of operation, 1975-76. (Evaluations conducted in the first two years have been documented elsewhere.*) It also provides longitudinal data on the achievement of students who participated in all three years of ESAA operations (1973-74 through 1975-76).

The ESAA Basic and Pilot programs provide grants to school districts for local elementary- and secondary-level projects designed to deal with minority-group isolation. The Basic program is a desegregation-assistance program designed to (a) encourage the elimination of minority-group isolation, (b) help meet special needs incident to the elimination of segregation and discrimination, and (c) help overcome educational disadvantages associated with minority-group isolation. In contrast to the Basic program, the ESAA Pilot program is essentially a compensatory education program for students enrolled in minority-impacted schools (i.e., schools with 50 percent or greater minority enrollment).

A major goal of the evaluation was to determine the impact of ESAA Basic and Pilot programs, in terms of the ESAA objectives, over a period of three school years. The first year's evaluation report was essentially a progress report on the initial implementation of the programs. The second year's report provided a more meaningful picture of program effects under relatively stable operating conditions, but results were still considered tentative, pending subsequent verification in the Year Three data. This report, which emphasizes longitudinal trends over the three years as well as cross-sectional data for Year Three, represents the culmination of the evaluation effort. It provides the best opportunity of the three yearly reports to examine longitudinal trends such as cumulative program impact and program maturation effects. Furthermore, because of improved methods used for the first time in Year Three to calculate per-pupil supplemental expenditures in sample schools (described in Chapter V), this report gives the most accurate picture yet of differences in expenditure patterns among districts, and between ESAA-funded and non-ESAA-funded schools. However, one constraint on the third-year impact analyses should be mentioned. Sample attrition between Years Two and Three reduced the number of Basic Secondary and Pilot Elementary schools in the third-year and longitudinal samples to a marginal level for assessment of program impact. Thus, the impact analyses in this report are most meaningful for Basic Elementary schools, of which a fairly large sample was maintained.

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The following paragraphs summarize the key findings of the Year Three evaluation in terms of the needs of ESAA students and schools; school expenditures and their relationship to the students' academic needs; ESAA program impact on student achievement; and the relationships between achievement and certain program characteristics and approaches.

Needs of Students and Schools in ESAA Districts

As in both previous years, sample students in Pilot and Basic schools showed clear evidence of need for compensatory education programs in reading and mathematics. Based on students' pretest scores on standardized reading and mathematics achievement tests, minority-isolated (Pilot) elementary schools had the greatest need (i.e., the lowest achievement), with average test scores for different grade levels ranging from the 17th to the 29th percentile, relative to the national norms. However, acute needs were also evident in desegregated (Basic) elementary schools (22nd to 38th percentile) and secondary schools (25th to 29th percentile). Overall, it appears that between 62 and 83 percent of our nation's students were achieving at a higher level than that of the evaluation sample students.

In general, minority students, whether in minority-isolated or desegregated schools, showed a greater need for compensatory education services than did non-minority students; this disparity nearly disappears if account is taken of the higher average socioeconomic status of the non-minority students. Non-minority (White) students in desegregated (Basic) schools tended to have higher achievement scores than did White students in minority-isolated (Pilot) schools; again, however, this finding may simply reflect a higher level of socioeconomic status on the part of the White students enrolled in desegregated schools.

The socioeconomic status of sample students' families was generally low. About one-fourth of the Basic students' and half the Pilot students' fathers had failed to complete high school, and half the fathers had jobs in the service or labor category.

A possible need for some sample schools to reduce discrimination and improve general school climate was indicated by the finding that minority students in both Basic and Pilot Elementary sample schools had less favorable perceptions than did non-minority students of their interactions with and treatment by school principals. It is important to note, however, that the school climate data do not represent independent observations of actual school practices; they are based entirely on the students' reports of their own attitudes and perceptions.

Expenditure Patterns in ESAA-Funded (Treatment) and Non-ESAA-Funded (Control) Schools

Total per-pupil expenditures for the Basic Elementary sample were significantly higher in treatment schools ($1,549) than in control schools ($1,169). In the Basic Secondary and Pilot Elementary samples, although the funding differences favored the treatment schools, those differences were relatively small and were not statistically significant. Thus, only the Basic Elementary sample exhibited a clear-cut treatment-control funding distinction of the type originally assumed in the study's experimental design.

More than half the total supplemental funds in all three evaluation samples were spent for basic skills instruction. Only the Basic Elementary sample showed significant treatment-control differences in actual dollar allocations and in the percentages of funds allocated for activities logically related to the study's outcome measures. In that sample, treatment schools spent more supplemental funds than did control schools for reading and math instruction, and for intergroup and cultural enrichment activities.

Relationships Between Resource Allocations and Needs

As in Years One and Two, the Year Three data showed allocation of ESAA funds to districts with acute academic needs. There was also evidence that the recipient districts and schools translated their ESAA funds into services appropriate for their students, and focused those services most heavily on the students with the greatest academic needs. However, contrary to the earlier years' findings, there was no evidence that Basic Elementary schools with the greatest academic need received the most supplemental funding; in fact, sample schools with the highest average pretest scores tended to have the highest per-pupil supplemental expenditure levels. The Basic Secondary and Pilot Elementary samples showed a tendency for the most needy (lowest-scoring) schools to have higher supplemental funding levels, but those trends were not statistically significant.

ESAA Program Impact

Evidence of program impact was found in Year Three for the Basic Elementary sample, although not for the Basic Secondary or Pilot Elementary sample. That is, the Basic Elementary sample showed statistically significant treatment-control differences, favoring the treatment (ESAA-funded) schools, in student achievement gains. This important finding is consistent with the fact that only in the Basic Elementary sample did treatment schools have significantly higher total per-pupil expenditure levels than did their paired control schools.

The finding of significant Basic Elementary program impact in Year Three, when no such significant impact was evident in Years One and Two, seems to have two explanations. First, there was apparently some increase in the treatment-control funding differential (favoring treatment schools) between Years Two and Three. Second, the greater evidence of program impact in Year Three may reflect program maturation effects. That is, by Year Three, the local ESAA projects may have completed most of their start-up activities, such as long-range planning, staff recruitment, and materials development; this may have freed them to concentrate more effort on activities of more immediate and direct benefit to the students, such as actual classroom instruction, and preparation and implementation of daily lesson plans.

There was no clear evidence of cumulative program impact (i.e., increasing treatment-group superiority in achievement) for students who had been in ESAA for all three years of the evaluation. In most cases, the control group started slightly higher (though in general not significantly so), and stayed slightly higher over successive test administrations, with little sign of any "catch-up" by the treatment group. One encouraging exception was in reading achievement for the Basic Elementary sample. Here, the gap between treatment and control schools was reduced between pretesting and posttesting in Year Three. Although this convergence trend was not statistically significant, it is consistent with the finding of ESAA program impact for the cross-sectional Basic Elementary sample in Year Three.

No significant trends or treatment-control differences were found in the data on school climate. This result was expected, because of the relatively poor psychometric properties of the School Climate Questionnaire (e.g., low inter-item correlations).

Relationships Between Program Characteristics and Student Achievement

Several exploratory analyses were performed on data for the Year Three cross-sectional samples and the three-year longitudinal samples, to identify district, school, program, and class/teacher variables associated with improved student achievement. The design underlying these analyses was quasi-experimental, as neither students nor schools were randomly assigned to the different treatment conditions being compared. No meaningful relationships were found in the longitudinal samples, but the cross-sectional data revealed several relationships of possible policy relevance. Although there was no evidence of any specific funding level at which programs improved dramatically (i.e., no "critical mass" was discovered), Basic and Pilot Elementary schools with higher per-pupil total expenditures and those with higher supplemental expenditures tended to have students with higher reading achievement. In addition, higher mathematics achievement was found in schools that had larger per-pupil total expenditure levels and in schools that provided more hours of math instruction to the students.

A positive relationship was found in the Basic Secondary sample between students' reading achievement and the extent of school activities designed to promote a favorable interracial climate. Surprisingly, however, a negative relationship was found in the Basic Elementary sample between such activities and student achievement. The apparently conflicting relationships for the two samples may reflect different stages of desegregation at the elementary and secondary levels; this interpretation is discussed in Chapter VII.

To summarize, the Year Three analyses produced the first clear evidence in this evaluation of positive ESAA program impact on student achievement. This impact was apparently limited to the Basic Elementary sample--not surprisingly, since only that sample satisfied the research design assumptions on which the impact analyses were based. Specifically, the Basic Elementary sample, but not the Basic Secondary or Pilot Elementary sample, had significant treatment-control differences, favoring the treatment (ESAA-funded) schools, in total per-pupil expenditures and in the allocations of funds for reading and math instruction.

In short, it appears that the award of ESAA funds can beneficially influence student performance provided: (a) the award results in significantly greater total per-pupil expenditures in recipient schools, and (b) greater per-pupil sums are expended for relevant instructional activities.

CHAPTER I

INTRODUCTION

In conjunction with and under contracts from the U.S. Office of Education, System Development Corporation (SDC) is conducting an evaluation of two closely related programs authorized under the Emergency School Aid Act (ESAA): the Basic and Pilot Grants programs. Basic Grants are awarded to eligible school districts to reduce minority-group isolation, to meet the special needs incident to the elimination of segregation and discrimination, and/or to assist elementary and secondary school children in overcoming the educational disadvantages associated with minority-group isolation. Basic Grants may be awarded to any Local Education Agency (LEA) that (a) is implementing a desegregation plan or has adopted and will implement such a plan if assistance is made available; or (b) has a plan to enroll non-resident children in its schools to reduce minority-group isolation; or (c) has no desegregation plan but has minority-group student enrollment exceeding 50 percent, provided that the LEA establishes or maintains at least one integrated school.

In contrast to Basic Grants, Pilot Project Grants are awarded to LEAs for unusually promising projects designed to overcome the adverse effects of minority-group isolation by improving the academic achievement of children in minority-isolated schools. To be eligible for a Pilot Grant, an LEA must be implementing a desegregation plan or a plan to reduce minority-group isolation that would make it eligible for a Basic Grant.* In addition, at least 15,000 minority-group students must be enrolled in the schools of the LEA, or minority-group students must constitute more than 50 percent of the total LEA enrollment.

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*Another authorized basis for granting Pilot awards is the district's application for a grant to establish an Integrated School Project. However, no Pilot Grants of this category were included in the present evaluation.

The combined Basic/Pilot evaluation involved the collection of data over a period of three school years: 1973-74, 1974-75, and 1975-76. Previous reports* described the evaluation results for 1973-74 and 1974-75; a brief summary of these findings is provided in Section C of this chapter. The present report describes results for the third evaluation year (1975-76), and also discusses longitudinal findings for the combined three years of the study. This report and a companion volume describing the ESAA in-depth study for 1975-76** conclude the major data analysis and reporting phases of the three-year evaluation.

Between March and November 1977, several additional analyses will be conducted. These small-scale follow-up studies will use data already in the evaluation data base to examine certain trends observed in analyses conducted for the three yearly reports. Results of the follow-up analyses will be documented by SDC in the form of technical memoranda.

As in the Year Two Report, the major criterion measures of program success in the present document are students' scores on standardized achievement tests in reading and mathematics, and responses on a School Climate Questionnaire designed primarily to assess the students' perceptions of the degree of discrimination in the schools.

It is anticipated that this report may have several different audiences, each with its own particular interests and knowledge. These potential audiences include Congress and the Office of Education, civil rights groups and other interested citizen groups, state and district program administrators, educational researchers, and evaluation specialists. Policy issues assumed to be of direct concern to these various audiences were defined by the U.S. Office of Education in 1972 and 1973, in the form of a list of evaluation objectives specified in the Requests for Proposals for the Pilot and Basic program evaluations. A summary of these objectives is given below in Section B.1, which also indicates the extent to which each objective is addressed in the present Year Three Report.

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*The First Year of Emergency School Aid Act (ESAA) Implementation. System Development Corporation, TM-5236/008/00, September 1975.

The Second Year of Emergency School Aid Act (ESAA) Implementation. System Development Corporation, TM-5236/009/00, July 1976.

**An In-Depth Study of Emergency School Aid Act (ESAA) Schools: 1975-76. System Development Corporation, TM-5236/013/00, March 1977.

Because the primary goal of the evaluation is to inform decision-makers, rather than to add to the literature on evaluation/research methodology, the major focus throughout the report is on results, not techniques. Excessive procedural details have been avoided and, where possible, major findings have been highlighted. Many of the data tables have been relegated to the appendix and are referred to in the appropriate pages of the text.

The remainder of this chapter provides a brief overview of the ESAA program legislation and funding, the evaluation objectives and methodology, and the previous years' evaluation findings, and discusses certain strengths and limitations of the present report. Chapter II describes the rationale and methodology of the evaluation sampling procedures, and discusses issues of sample representativeness. Chapter III presents data on background characteristics of the sample students, including Year Three pretest performance. Chapter IV discusses demographic characteristics of the sample districts and schools, while Chapter V describes the more dynamic and manipulable program characteristics, including expenditures, resource allocations, and services to students. Chapter VI discusses gains in achievement test scores and in school climate measures during the 1975-76 school year, comparing outcomes for ESAA-funded and non-ESAA-funded schools to assess ESAA program impact; in addition, major emphasis is placed on patterns of changes in achievement test scores over the three years and six test administrations of the study. Chapter VII attempts to relate the outcome measures to a variety of student, program, and contextual variables to determine what types of programs were most effective for what kinds of students. Finally, Chapter VIII presents an overall summary of the major findings and conclusions for Year Three, as well as longitudinal findings for all three years.

A. OVERVIEW OF ESAA PROGRAM LEGISLATION AND FUNDING

The Emergency School Aid Act was enacted into law in June 1972 to provide elementary and secondary school districts with financial assistance to (1) meet the special needs incident to the elimination of minority-group segregation and discrimination; (2) encourage the voluntary reduction, elimination, or prevention of minority-group isolation; and (3) aid children in overcoming the educational disadvantages of minority-group isolation (P.L. 92-318, Sec. 702(b)). While the Act, as amended in 1974 (P.L. 93-380, Sec. 641), authorized the appropriation of $1 billion for fiscal year 1973 and a similar amount for fiscal years 1974, 1975, and 1976, actual appropriations amounted to $228 million, $234 million, $215 million, and $215 million for fiscal years 1973, 1974, 1975, and 1976, respectively.

ESAA originally authorized eight subprograms; three of these were state apportionment programs (Basic Grants, Pilot Grants, and Nonprofit Organization Grants), and the remaining five (Bilingual Education, Educational Television, Metropolitan Area, Special Projects, and Evaluation) were discretionary grant programs. The Metropolitan Area Projects subprogram and its three- to four-percent reservation from the annual appropriation were eliminated from the program by Section 642 of P.L. 93-380 in August 1974. Since that amendment, and in accordance with status and regulation, 87 percent of the annual appropriation is reserved for the state-apportioned programs: Basic Grants, 64 percent; Pilot Grants, 15 percent; and Nonprofit Organization Grants, 8 percent. The remainder of the annual ESAA appropriation is reserved as follows for the discretionary programs: Bilingual Education, not less than 4 percent; Educational Television Project, 3-4 percent; Special Projects, 5 percent; and Evaluation awards, up to 1 percent.

The state-apportioned sums appropriated annually, pursuant to the Act, are divided among states on the basis of the ratio of each state's number of minority-group school-aged children to the number of such children in all states. Local school districts compete for the funds apportioned to their state through grant applications to their HEW Regional Office. In applying for an ESAA grant, a local school district must demonstrate that it has needs related to the Act's objectives and that it has designed a program based on authorized activities that shows promise of achieving one or more of the Act's objectives.

B. DESCRIPTION OF ESAA EVALUATION

The Act authorizes a national evaluation of its programs and sets aside up to one percent of its annual appropriation to support such activities. As initially designed by the U.S. Office of Education and conducted by System Development Corporation, the evaluation effort focuses on an integrated evaluation of the ESAA Basic and Pilot programs. The remainder of this section summarizes the major evaluation objectives for both programs and describes the general methodology applied to meet those goals.

1. EVALUATION OBJECTIVES

The overall evaluation has several major objectives, some of which involve analyses of data collected within a single school year, while others involve longitudinal analyses and comparisons of data collected over two or three years. Certain other objectives involve data collected in special studies for which separate reports are prepared. The key study objectives are summarized below; each objective is accompanied by a brief note concerning the extent to which that objective is addressed in this report.

- Determination of the short- and long-term national impact of ESAA in terms of the Congressionally authorized program objectives; namely, reduction in minority-group isolation, elimination of discrimination, and improvement of basic skills in elementary and secondary schools. The Year One Report covered only the 1973-74 school year, and only a single type of outcome measure: performance on standardized achievement tests. The present Year Three Report, like the Year Two Report, includes impact analyses on school climate as well as on achievement. It also includes three-year (1973-74 through 1975-76) longitudinal analyses of program impact on achievement. It was not possible to compare reduction of minority-group isolation in ESAA-funded and non-ESAA-funded districts, and thus to assess ESAA's impact on minority-group isolation, because the Office of Civil Rights did not collect such data on a national sample of districts in 1975-76.

- Identification and description of the needs of students in or from minority-isolated schools; the characteristics of local programs, including the relationships between student needs and resource allocations in the sample districts; and the interrelationships among student needs, program characteristics, and program impact. This objective is addressed directly in the present report.
- Documentation and dissemination of information on unusually successful local programs and on program components that appear related to success. In-depth data on successful sites are the subject of a separate report now in preparation.
- Investigation of the relationship among regular school expenditures, supplemental ESAA expenditures, and program impact, in an attempt to determine local program cost-effectiveness and the minimum supplemental expenditures necessary to ensure some measure of program success. This objective is directly addressed in this report.

2. GENERAL METHODOLOGY

The combined Basic/Pilot evaluation involved the collection of data over a period of three years, beginning with the 1973-74 school year and ending with the 1975-76 school year. This multi-year design allowed analyses of cumulative program impact and of possible fadeout or consolidation of program impact after students were transferred out of ESAA activities. In addition, it provided an opportunity to assess program maturation effects (e.g., greater program impact on each successive wave of new students in the second and third years of operation).

For both Pilot and Basic programs, standardized achievement tests were administered at the beginning and end of each school year to assess gains made in reading and math by a sample of students participating in the ESAA projects. The same tests were given to samples of students in both treatment (ESAA-funded) and control (non-ESAA-funded) schools.

To select the treatment and control schools, pairs of similar schools were identified in the sample districts; one member of each pair was randomly assigned to the treatment condition and the other to the control condition. Sample students were then drawn randomly across classes in each sample school at the grade levels of interest. Thus, the treatment variable underlying this study's impact analyses was the award or denial of ESAA Pilot or Basic funds to a school. This emphasis on matched schools within districts made it possible to hold important district factors common in paired comparisons of treatment and control schools; further, the random assignment of schools in each pair to the treatment and control conditions helped to maximize the initial comparability (equivalence) of the treatment and control groups for the impact analyses.

Because of interest in evaluating ESAA programs at both the elementary and secondary levels, schools at both levels were included in the Basic Grant program sample. Too few Pilot awards were given at the secondary level to include high schools in the Pilot sample. Grades 3, 4, and 5 (elementary) and 10, 11, and 12 (secondary) were studied. The use of three successive grades at each grade level allowed individual sample students to be followed longitudinally for up to three years, depending on their grade placement at the start of the evaluation. To be eligible for inclusion in the study, schools were required to have sufficiently large numbers of ESAA participants (or ESAA-eligible students, in the case of control schools) to allow for attrition over the evaluation period; toward this end, larger samples were initially drawn at grades 3 and 10 than at other grades, to allow those samples to be followed for three years.

Two other major outcome measures planned for the multi-year evaluation consisted of data on perceived discrimination (school climate) and on reduction of minority-group isolation. School climate data were not available in Year One, but are included in the present report and were also presented for Year Two. Minority-group isolation is primarily a district-level rather than a school-level variable, so that it is of little use in school-level impact analyses. At the district level, as noted above, no isolation data were available in 1975-76 for any national sample of districts; therefore, no comparisons of ESAA-funded and non-ESAA-funded districts could be performed. However, descriptive statistics on several variables related to desegregation policies and practices in the sample districts are presented in Chapter V of this report.

In addition to the outcome measures, questionnaires and other recording forms were used once each year to obtain extensive data on the school programs themselves (in both treatment and control schools) and on sample students. Near the end of each school year, a battery of questionnaires was administered to superintendents, district business managers, district ESAA coordinators, principals, teachers, and students in the sample. These questionnaires provided data on district, school, and classroom minority-group isolation, program operation, resource allocation, and student and staff background characteristics.

Finally, student activity logs were used to record the amount of time that a student was exposed to different types of educational experiences (e.g., peer tutoring in math, cultural enrichment programs, etc.). The logs provided a cumulative record of each student's interactions with the educational system, with emphasis on compensatory and desegregation-related activities of the sort presumably stressed by ESAA projects.

Data analyses, designed to focus on the major evaluation goals described above, included determinations of pretest-posttest changes in outcome measures, to assess overall gains across both treatment and control schools; comparisons of pretest-posttest gains between treatment and control schools in the matched pairs, to evaluate the impact of the experimental variable (ESAA funding); comparisons of outcomes associated with different intervention approaches; ranking of local programs with respect to impact, to identify particularly successful projects; and analyses of relationships among program features, student characteristics, and program impact. In connection with the third-year evaluation, school expenditure data were analyzed in relation to impact data to determine the minimum supplemental expenditures associated with program success and to identify local project components that differentiated successful from unsuccessful projects.

C. EXPERIMENTAL CHARACTERISTICS OF STUDY DESIGN

It is generally recognized that a true experimental design, involving random assignment of students or schools to treatment and control conditions, provides the most rigorous basis for assessment of treatment effects (e.g., program impact). In the ESAA evaluation, strong emphasis was placed on achieving a true experimental design.* In the first year of the study (1973-74), a pair of similar ESAA-eligible schools was selected from each sample district. One member of each pair was randomly assigned to receive ESAA funds; the other was designated a control (non-ESAA-funded) school. It was assumed that this procedure would produce treatment and control groups consisting of initially equivalent schools. Further, it was assumed that the allocations of other, non-ESAA funds would be unaffected by the granting or denial of ESAA funds. Thus, in theory, total per-pupil expenditures for sample students in treatment schools would exceed those for sample students in control schools by an amount approximately equal to the treatment schools' per-pupil ESAA funding. Finally, it was assumed that these funding differences would be translated into more services (e.g., greater allocations of staff time) for the sample students in treatment (ESAA-funded) schools. Those enhanced services would, it was theorized, lead to superior outcomes for the treatment schools, attributable to the ESAA program. (Even by its original conception, the experimental design would apply only to school-level comparisons of outcomes in paired treatment and control schools. All other analyses relating program variables to each other, to pretest performance, or to pretest-posttest changes would be, at best, quasi-experimental, since randomization procedures were not applied to the distribution of any program variables, other than ESAA funding, among the sample districts, schools, or students.)

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*The term "true experimental design" is used here in the sense described by Donald T. Campbell and Julian C. Stanley as Design 4, "The Pretest-Posttest Control Group Design" (Experimental and Quasi-Experimental Designs for Research, Chicago: Rand McNally, 1963, pp. 13-24).

How well were the conditions of the true experimental design satisfied in this study? In Year One (1973-74), many of the assumptions discussed above were met. Schools were assigned to treatment and control conditions in accordance with planned randomization procedures, and the Year One data indicated an excellent initial matching of the treatment and control groups.* Furthermore, although it was originally believed that treatment-control differences in total per-pupil expenditures were extremely small, it now appears that there may have been a substantial funding advantage for the treatment schools, at least in the Basic Elementary sample; this revised viewpoint is based on the results of cost analyses performed on Year Three data with improved calculation procedures, and described in Chapter V, Section A, of the present report. However, the Year One data did not show clear-cut differences in resources or services reaching the treatment and control groups. In this last respect, therefore, the experimental paradigm underlying the impact analyses was not fully satisfied.

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*The First Year of Emergency School Aid Act (ESAA) Implementation. System Development Corporation, TM-5236/008/00, September 1975.

In Year Two, and especially in Year Three, two important factors acted to complicate the study design and to create more serious deviations from the true experimental design. One source of deviation was the sampling procedures for Years Two and Three. Because of the desire to maintain a large longitudinal sample, schools were retained in the sample from one year to the next, where feasible, and the treatment or control status of a school was simply carried over from the preceding year. Thus, for cross-sectional (one-year) analyses of ESAA program impact, the assumption of random assignment of schools to treatment and control conditions at the beginning of each year was not satisfied. Possibly as a consequence, some initial inequities in the treatment and control groups' characteristics (e.g., pretest scores) appeared in Year Three.

The retention of sample schools across years, without re-randomization of assignments to treatment and control conditions, does not complicate the longitudinal impact analyses in the same way as it does the cross-sectional analyses. That is, the assumption of initial randomization of assignments is still valid for the longitudinal cohort, when treatment-control comparisons are made of achievement gains between Year One pretest and Year Three posttest. Differential attrition effects must be examined in such comparisons, however, as they may introduce sample bias; this possible threat to the longitudinal impact analysis is examined in Chapter VI.

A second potential source of deviation from the true experimental design was introduced in Years Two and Three by the "leakage" of ESAA funds into "control" schools. In an effort to retain as many schools as possible for the longitudinal samples, compromise funding arrangements were made in a number of districts; these compromises occurred primarily in the Pilot Elementary and Basic Secondary samples, which were marginal in size even at the outset of the study. In some districts that claimed special hardship situations, the control school was allowed to spend ESAA funds at grade levels other than those of direct interest to this study. In a small number of cases, a control school was allowed to use ESAA funds at a grade level of interest, but not for students in the study sample.

Although districts with the most blatant and uncontrolled "leakage" of ESAA funds to control schools were eliminated from the impact analyses, it seems clear that the assumption of a clear-cut ESAA funding distinction between treatment and control schools was violated to some degree in the Pilot Elementary and Basic Secondary samples and, to a considerably smaller extent, in the Basic Elementary sample. Theoretically, of course, no ESAA funds or resources directly reached sample students in any control school. It is probably unrealistic, however, to assume that the substantial ESAA expenditures in some control schools would have had no indirect or spillover effect on the sample students.

In summary, the Year One impact analyses represented at least a close approximation to a true experimental design, although the differences in services provided to treatment and control students were not as large as expected. The three-year impact analyses based on the longitudinal cohorts also meet most of the requirements of a true experiment; here, however, differential attrition effects and possible sample bias over the three evaluation years could pose a potential threat to the validity of treatment-control comparisons (see Chapter VI for a discussion of this issue). Finally, the cross-sectional (one-year) impact analyses for Year Two and Year Three should be regarded as quasi-experiments rather than as true experiments, for the reasons outlined above.

Overall, the experimental conditions underlying this study's impact analyses for the Basic Elementary sample (the largest and most stable in composition over the three years) were probably at least as well controlled as those in any previous long-term national study of educational programs. Because of the small size of the award universes for Pilot Elementary and Basic Secondary programs, the samples for those programs were marginal in size and fairly unstable in composition across years; this factor, combined with the ESAA funding compromises necessary to maintain even small samples over the three years of the study, considerably reduces the confidence that can be placed in results of the impact analyses for those two samples.

D. SYNOPSIS OF FIRST TWO YEARS' FINDINGS

The first-year (1973-74) evaluation samples (treatment plus control) included 74 Basic Elementary schools, 28 Basic Secondary schools, and 55 Pilot Elementary schools in 82 ESAA-funded school districts; the corresponding figures for Year Two (1974-75) were 70 Basic Elementary schools, 38 Basic Secondary schools, and 44 Pilot Elementary schools in 78 districts. Findings for the two years were generally similar, and included the following:

- Sample students showed clear academic needs, as evidenced by their pretest performance on the achievement tests in reading and mathematics. Though performance varied across grade levels and across evaluation samples, all of the mean scores were well below the 50th percentile, with the bulk lying between the 13th and 37th percentiles. There was also considerable evidence that most sample students were socioeconomically disadvantaged. Pilot sample students had lower pretest scores than Basic Elementary sample students, but this difference essentially disappeared when the racial/ethnic composition of the samples was taken into account. Minority students in both desegregated and minority-isolated schools generally scored between the 15th and 30th percentiles, but non-minority students in desegregated (Basic) elementary schools made substantially higher average test scores than non-minority students in minority-isolated (Pilot) elementary schools. This latter finding might be interpreted as reflecting a superior learning environment, for non-minority students, in the desegregated schools; however, an alternative interpretation, and one that has some support in analyses discussed in Chapter IV, is that non-minority students in the desegregated schools tended to have higher socioeconomic status and higher initial ability (pretest scores) than those in minority-isolated schools.

- Investigation of program resource allocations indicated that the ESAA grant award process led to the selection of needy districts, that those districts selected needy schools for ESAA participation, and that the schools provided services to needy students through the local ESAA programs. Furthermore, a consistent relationship was found between students' achievement pretest scores and amount of exposure given to students in different areas of academic content. Thus, it appears that the ESAA programs at the federal, LEA, school, and classroom levels were appropriately focusing their resource allocations in the areas of greatest student needs.

- Sample students as a whole (i.e., both treatment and control students in Basic and Pilot districts) made significant achievement gains during the school year, but were still below the national norms (median) on the posttest. Comparisons were made in both years between the sample students' gains and those that might have been predicted from national norms for students having similar pretest scores. Using this criterion, there was some suggestion of larger-than-predicted gains by both the treatment and control groups. One possible inference is that the ESAA funds, added to the general pool of dollars available to the sample districts, allowed the districts to increase the total supplemental budgets of control schools as well as treatment schools (e.g., by giving more ESEA Title I funds to the control schools), and thereby helped to enhance achievement in both treatment and control schools. However, interpretation of these findings is difficult because the pretest norms for the achievement tests in question are not empirically based; rather, they represent extrapolations by the publisher from data collected toward the end of a school year.

- Total 1974-75 per-pupil expenditures in the sample ESAA-participating (treatment) schools were significantly higher than those in the paired non-ESAA-funded (control) schools, for all three samples; in 1973-74, the treatment-control differences were significant only for the Basic Elementary and Secondary samples. In both years, the funding differences were relatively small in proportion to either of the two expenditure figures being compared. There was indirect evidence that some of the control schools may have been given additional funds from other, non-ESAA, supplemental sources, thus tending to restrict the treatment-control differences in total per-pupil expenditures.

- With few exceptions, the treatment and control schools did not differ significantly either in the size of allocations for program activities having apparent relevance to the study's outcome measures, or in services provided to the students.
- Not surprisingly, given the lack of clear-cut treatment-control differences in program resources and services, and the wide variations in program approaches among ESAA schools, no evidence was found of overall differences in achievement gains or school climate between ESAA-funded and non-ESAA-funded schools. During the second year (1974-75), treatment (ESAA-funded) schools in the Basic Elementary sample made larger gains than paired control (non-ESAA-funded) schools in both reading and mathematics, and in all three grade levels sampled. Despite the consistency in direction of these findings, however, none of the differences were statistically significant.
- Quasi-experimental evidence, based on comparisons among sample schools (regardless of treatment-control designation), revealed significant relationships between several program variables and students' achievement gains.

  In the Pilot Elementary sample for Year One, larger reading score gains were associated with higher levels of per-student supplemental expenditures for reading, and also with higher levels of regular district expenditures; larger math gains were found in schools with lower pupil-to-teacher ratios. The Basic Elementary sample for that year showed a tendency for larger achievement test gains in schools that had more activities designed to support desegregation efforts, and that used more diagnostic testing. In the Basic Secondary sample, greater amounts of classroom time devoted to reading instruction were associated with larger reading score gains.

Results in Year Two (1974-75) showed similar overall patterns, but differed somewhat in their specifics. In both the Basic and Pilot Elementary samples, larger reading and math score gains were associated with higher per-student levels of regular district funding and, to a lesser extent, with higher total per-student expenditures. In the Pilot Elementary sample, larger math score gains were found in schools that had larger supplemental per-student expenditures for math instruction, and that gave more drill-and-practice in mathematics. The Basic Elementary sample showed a positive relationship between reading score gains and the recency of teacher inservice training for reading instruction. Finally, larger reading score gains were found in Basic Secondary schools that conducted more activities supportive of desegregation efforts, while larger math score gains occurred in secondary schools that devoted more instruction time to math, that used more highly-trained math teachers, and that had smaller student-to-teacher ratios.

E. STRENGTHS AND LIMITATIONS OF PRESENT REPORT

This Year Three Report represents the culmination of efforts to assess the impact of the ESAA Basic and Pilot programs on student achievement and school climate, and to relate specific characteristics to variations in gains on those outcome measures. It is based upon a three-year history of achievement test scores and two years' data on school climate for longitudinal samples of students and schools, and thus provides an excellent opportunity for evaluation of possible cumulative program effects as well as a cross-sectional picture of gains in the 1975-76 school year.

Another important advantage of this year's report is that all achievement test scores at the elementary school level have been restandardized to provide better comparability and a smoother growth progression across alternate test forms and across different levels of the California Achievement Test. Restandardization tables were developed by SDC (see Appendix VI-A for full description), using the evaluation's pretest data for 1975-76. Because they are based almost entirely on data from the lower deciles of the nation's total student population, the modified norms used for this report eliminate some of the metric anomalies found in the publisher's norms, which are based on samples that included only small percentages of low-end students.

The quality of program description data was also improved for Year Three. Student Activity Logs were revised to reduce ambiguities and to eliminate redundancy among categories of student activities for which exposure data were collected. Other changes were made in questionnaires to provide better data on overlap in the numbers of sample students receiving services under different compensatory education programs.

Despite these improvements, however, some caution must be exercised in interpreting results of the Year Three analyses. Because of sample attrition over the three years of data collection, and because no replacement sample districts or schools were drawn in Year Three, it is difficult to assess the representativeness of the third-year samples with respect to the ESAA award universes. (See Chapter II for further discussion of this issue.)

Considerable emphasis has been placed in this report on attempts to replicate key findings of the Year Two Report, with respect to relationships between certain program characteristics and student outcomes. Because of the difficulties inherent in attempting to apply a common evaluation model to highly heterogeneous programs such as the ESAA Basic and Pilot programs, at least as much attention has been given here to variations in program success, and to factors associated with those variations, as to the overall impact analyses.

As noted in earlier documentation, the present study concerns only the Basic and Pilot programs, and not five other subprograms also authorized under ESAA. However, the Basic and Pilot programs, combined, account for almost 80 percent of total ESAA expenditures.

The Office for Civil Rights (OCR) did not conduct a general survey of districts in 1975-76, but instead collected data on only a small number of districts having characteristics of special relevance to OCR's operations. Thus, no baseline data on racial/ethnic distributions, minority-group isolation, enrollment sizes, or other demographic characteristics were available for that year's ESAA award universes or for any representative sample of the nation's districts. As a consequence, the Year Three Report does not include comparisons between the sample districts and the ESAA award universes on any dimension other than geographic distribution, but does present data on variations among the sample districts themselves.

Results of the ESAA in-depth study for 1975-76 are reported in a separate document.* In the in-depth study, detailed interview and observation data were collected (in addition to the regular ESAA evaluation data) in a subset of 30 schools chosen to provide good contrast in levels of program success. These data were analyzed to determine what program characteristics most clearly differentiated successful from less successful local projects.

Before examining the substantive findings of the Year Three evaluation, it is important to consider the sampling procedures and the resulting evaluation samples at the district, school, and student levels. The following chapter reviews the project's original sampling strategy, and then traces the successive changes in sample composition over the three evaluation years. Chapters III and IV present descriptive data on certain background and demographic characteristics of the resulting Year Three cross-sectional samples and longitudinal (three-year) samples.

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*An In-Depth Study of Emergency School Aid Act (ESAA) Schools: 1975-76. System Development Corporation, TM-5236/013/00, March 1977.

CHAPTER II

EVALUATION SAMPLING GOALS AND PROCEDURES

Because of the study's emphasis on the three-year longitudinal cohorts, and because the Year Three samples were largely carried over from the preceding year, this chapter reviews the sampling goals and methodology for all three evaluation years, and traces changes in district-, school-, and student-level sample composition over those three years. The final Year Three Basic Elementary cross-sectional sample consisted of 24 districts and 48 schools, including 22 treatment-control school pairs that yielded valid data for impact analysis purposes; the Basic Secondary sample had 13 districts and 28 schools (all in treatment-control pairs); and the Pilot Elementary sample had 17 districts and 30 schools, including 13 usable treatment-control school pairs. The Basic Elementary three-year longitudinal sample consisted of 17 districts and 34 schools in valid treatment-control pairs; the Basic Secondary longitudinal sample had 7 districts and 16 schools; and the Pilot Elementary longitudinal sample had 8 districts and 16 schools. This chapter also discusses issues of sample representativeness, but any definitive analysis of Year Three sample representativeness was precluded by the unavailability of detailed data on characteristics of the Year Three ESAA award universes from which the samples were drawn.

To interpret the analyses discussed in later chapters of this report, it is important to understand the nature and derivation of the samples on which those analyses were based. This chapter summarizes the sampling goals and procedures not only for Year Three of the ESAA evaluation, but also for Years One and Two. Consideration of the earlier years' sampling is important for two reasons. First, as noted in Chapter I, some of the major objectives of the evaluation are concerned with cumulative program effects for students exposed to the program for two or more years. Also of interest is the issue of possible program maturation effects in schools that have had ESAA programs for more than one year. Effective examination of these issues required that as many schools and students as possible be retained in the evaluation samples from year to year. Thus, the Year Three sample was derived in large part from the earlier years' samples, and can be understood only in the light of sampling procedures used in Years One and Two.

The second reason for this chapter's discussing sampling procedures for all three evaluation years relates to the issue of sample representativeness. An evaluation of this type would normally attempt to establish the representativeness of the sample districts and schools by comparing their characteristics with corresponding data for the universe of districts and schools from which those samples were drawn, i.e., the universe of ESAA Basic and Pilot awards for Year Three. Unfortunately, such comparisons are not possible in this instance, as no information was available about any characteristic of the Year Three award universe except geographic distribution. Thus, one section of this chapter compares the relative proportions of sample and universe sites in different regions of the country, but any other inferences about sample representativeness must be drawn from the procedures used to establish the initial samples in Year One and to select replacements in subsequent years, and from the data on changes in sample characteristics over successive evaluation years.

The first three sections of this chapter describe the sampling strategy and methodology for Years One, Two, and Three, respectively. The fourth section summarizes certain characteristics of the resulting Year Three sample.

A. GOALS AND PROCEDURES OF YEAR ONE SAMPLING

Implicit in the ESAA evaluation objectives listed in Chapter I were several important requirements for the evaluation sample:

- Evaluation data were needed at both the elementary and secondary levels, as there was strong interest in ESAA program operations and impact at both levels.
- The longitudinal nature of the study required data collection at several grade levels, so that cohorts of students starting ESAA participation at different times and grades could be followed for more than one year. To meet this requirement, three consecutive grade levels were selected at the elementary level (grades 3, 4, and 5), and three were selected at the secondary level (grades 10, 11, and 12).

- Sufficiently large samples of students were needed at each level in each sample school to allow for anticipated attrition over a period of up to three years.
- The evaluation universe was limited where possible to districts having two or more schools designated for ESAA participation. By this means, matched pairs of treatment and control schools could be sought with total intradistrict equating of district-level variables.

Based on the general sampling requirements listed above, evaluation universes were defined; that is, specifications were prepared that defined the total sets of districts and schools potentially eligible for inclusion in the evaluation samples. An initial step in defining evaluation universes was the listing of all districts receiving Pilot and/or Basic ESAA awards for school year 1973-74 in April or June 1973. The resulting universes were then further limited to districts having Basic and/or Pilot programs planned for grades 3, 4, and 5, or for grades 10, 11, and 12.

At this point, district grant applications were reviewed to determine how many districts were likely to meet the evaluation universe requirements as initially defined. Data available in most applications included the names of ESAA-participating* schools, participating grade levels, numbers of participating students, percentages and types of participating minority students, and types of ESAA activities planned.

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*For purposes of this sampling discussion, schools or students are labeled as "participating" in ESAA activities if they were so designated in the district grant applications. In reality, none of the schools or students were actively engaged in ESAA activities at the time of the sample selection; furthermore, some of them were ultimately assigned to the control (non-ESAA-funded) condition, and therefore never participated in ESAA programs.

Based on data in the district grant applications and on study design requirements, a preliminary sample plan was adopted, subject to final revision as further data became available on the ESAA programs. Major features of the plan were as follows:

- Three independent evaluation universes would be defined and sampled: a Pilot Elementary universe, a Basic Elementary universe, and a Basic Secondary universe. No Pilot Secondary schools would be considered, since the number of Pilot awards involving secondary schools was small.
- The Pilot and Basic Elementary samples would include students at grades 3, 4, and 5, and the Basic Secondary sample would include grades 10, 11, and 12.
- For each of the three universes, a sample of at least 25 pairs of participating schools would be sought. Schools would be paired by similarity in minority-group enrollment, in pre-ESAA achievement level, and in socioeconomic status. Within pairs, treatment and control conditions would be randomly assigned, and ESAA funds would be withheld from one school of each selected "participating" pair of schools.
- Students would be sampled across classes, rather than by intact classes, to increase the number of classes and teachers represented within the sampling constraints.

The sampling plan, as described above, still represented a goal rather than an accomplished fact. To determine the feasibility of some specific features of that plan, more detailed information was obtained on each ESAA grant awardee, including data about the participating grade levels within each school, the number of ESAA-participating students in each grade, the type and percentage of each minority group in the school's enrollment, comparative ratings within each district of each school's prior academic achievement, and comparative ratings within the district of each school's socioeconomic status. These data were used to reach a final definition of the three evaluation universes, and to develop sampling procedures within each universe, as described in the following paragraphs.

1. FINAL DEFINITION OF EVALUATION UNIVERSES, AND ADJUSTMENT OF PLAN FOR SAMPLING DISTRICTS AND SCHOOLS

a. Basic Elementary Sample

The Basic Elementary evaluation universe consisted of districts receiving Basic Elementary Grants in April or June 1973, and containing two or more pairable schools with Basic program activities designated for grades 3, 4, and 5. (Schools were considered pairable if they had similar student socioeconomic status, pre-ESAA achievement, and percentages and types of minority enrollment.) An additional requirement was that each participating school have at least 50 participating students in each of those grades. Because it was evident that more than an adequate number of districts would meet these criteria, the universe of eligible districts was reduced further by eliminating a 50 percent random sample from the set of districts having comparatively small numbers of participating schools or having only one or two of the grade levels of interest. The resulting universe contained 47 Basic Elementary districts.

b. Basic Secondary Sample

The Basic Secondary evaluation universe consisted of all districts receiving Basic Secondary Grants in April or June 1973, and containing two or more pairable schools with Basic program activities designated for grades 10, 11, and 12. A further design goal was that each participating school have at least 50 students in each of those grades. Twenty Basic Secondary districts met these criteria, and all were assigned to the evaluation sample. Therefore, at the district level, the sample was identical to the evaluation universe.

Each district became a stratum, and the school became the primary sampling unit.* One school was selected randomly from each district. The school that was the "best possible" match was then selected by employing the above criteria. One school in this pair was randomly assigned to the treatment condition, and the other automatically became the control school for that district.

Even though this procedure resulted in fewer than the 25 pairs of schools desired for the Basic Secondary sample, it was decided that sampling more than one pair of schools in a district would be too great a hardship on the district. One school of each pair was randomly assigned to the treatment condition, and the other school was assigned to the control condition.

c. Pilot Elementary Sample

Because of the relatively small number of funded Pilot programs, it was necessary to select both a primary evaluation universe and a supplemental evaluation universe. The primary evaluation universe consisted of all districts that received Pilot Grants in April or June 1973, and that contained two or more pairable schools with Pilot activities in at least two consecutive grade levels of interest. An additional requirement was that each participating school have at least 25 participating students in each of grades 3, 4, and 5.

Only 17 Pilot districts could be identified that met the requirements of the primary evaluation universe. All of these districts were included in the final sample, which was intended to contain at least 25 districts with pairable schools. Thus, as in the Basic Secondary program, the sample was identical to the primary evaluation universe.

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*For sampling purposes, a "feeder" school and its corresponding "fed" school (e.g., where one school covers grades K through 3 and provides students to another school covering grades 4 through 6) were treated as a single school unit. However, data tables presented in later chapters of this report frequently treat the two schools separately, in order to describe the variability among distinct physical entities.

A pair of schools was randomly selected from each district, using the same procedure described for the Basic Secondary sample. Because of the small number of resulting pairs, it was felt necessary to select additional Pilot schools that could not be paired. (These ESAA-participating schools were to round out the sample for descriptive purposes, but could not be used, of course, in the experimental analysis of treatment-control differences in achievement test scores.) Thus, a supplemental sample was drawn of unpaired treatment schools.

Thirty-five districts were designated for inclusion in the final Pilot sample. This number included 17 districts with matched pairs of treatment and control schools (i.e., districts in the primary evaluation universe), and 28 districts with a single treatment school. (Ten districts had both a treatment-control pair and a single treatment school.) Of the total of 62 schools, therefore, 45 were treatment schools.

2. SAMPLING STUDENTS WITHIN SCHOOLS

Student selection was the second stage of the two-stage probability sampling procedure. Rosters of students participating in ESAA were requested, by grade, from treatment schools. The control schools were asked to provide rosters of students who would have received ESAA-funded services if the school had not been assigned to the control condition. Students with severe mental, physical, or linguistic handicaps were excluded from all rosters.

Students' names were chosen from the rosters by a random procedure within grade. For the third grade of the Pilot sample, 90 students, if available, were selected across all classes within a school. The first 60 of the 90 were included in the final sample if they were present and were tested during Fall achievement testing. The remaining students were included in the sample as needed, in the order in which they were drawn, to replace absentees and to reach the desired total of 60. The same procedures were used for Pilot fourth and fifth grades, except that 45 names were drawn for each grade (the desired final total being 30 per grade). For the Basic samples, 90 names were drawn to obtain 60 students at each grade level.

In small schools or small ESAA programs, it was often difficult to reach the desired total of 60 or 30 students per grade. In these cases, testing personnel asked school authorities, just prior to the test day, whether any new students meeting study criteria had arrived in school since the rosters had been sent to SDC. If so, names of these new students were added to the previously prepared lists, and the students were drawn into the samples as needed.

3. SUBSEQUENT REVISIONS IN YEAR ONE SAMPLES

A certain amount of sample shrinkage occurred between the final designation of sample districts and the pretest administration. In many cases, adjustments were made so that districts could remain in the sample, but in some instances, districts were dropped from the study. In addition, some attrition in the study sample occurred between the fall of 1973 and the spring of 1974. All adjustments and changes to the original evaluation sample are discussed below, and the final Year One samples resulting from these adjustments are described.

a. Special Adjustments in Individual Districts

The great majority of selected districts agreed to participate as stipulated in the sampling design. However, some districts claimed that their participation would create severe problems at the local level. These problems were handled in a variety of ways, depending upon local conditions. Where hardships were claimed, resolutions were worked out directly between USOE and the districts. In some cases it was necessary to select new pairs of schools; when this occurred, those pairs were randomly drawn and the treatment-control conditions were randomly assigned. In other cases, students were randomly assigned to treatment and control sections within schools.* Finally, in some control schools, limited ESAA activities were allowed in specified grades outside the grades of interest in the evaluation. Because of the comparatively small number of secondary schools in most districts, secondary control schools tended to create the greatest burden for districts. Some districts requested that no schools be assigned to the control condition; pairs of treatment schools were selected in these cases, but were not included in any treatment-control comparisons.

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*In analyses comparing treatment and control programs and outcomes, these within-school sections were treated as separate schools. For analyses describing characteristics of the schools themselves (i.e., where data for the two units would be identical), the two sections were treated as a single unit.

In addition to these adjustments, several districts changed their programs during the year in such a way that they no longer fell inside the boundaries of the evaluation universe. For example, some districts withdrew from ESAA, and some districts reassigned funds to grade levels not in the study or to schools not selected for participation. In these cases, the districts were dropped from the study. Also, two large urban districts in eastern cities did not release Spring questionnaire and posttest data until it was too late to include them in the Year One analyses. One district had a large percentage of Black students and the other had the largest Spanish-background population of the districts originally included in the evaluation sample.

b. Schools in Final (Pretest-Posttest Overlap) Evaluation Samples

Table II-1 shows the district- and school-level composition of the three evaluation samples for all three years of the study. This table presents in capsule form the various deletions and additions of districts and schools over successive years, leading to the sample's final composition in Year Three.

The top row of Table II-1 summarizes the final Year One evaluation samples, which consisted of schools for which complete pretest-posttest achievement data were collected. Overall, the Basic Elementary sample consisted of 37 treatment-control pairs; the Basic Secondary sample consisted of 12 pairs and 6 unpaired treatment schools; and the Pilot sample consisted of 18 pairs and 25 unpaired treatment schools. However, the distribution of paired treatment and

TABLE II-1. SUMMARY OF SAMPLE DISTRICTS, SCHOOLS, AND TREATMENT-CONTROL PAIRS, OVER THE THREE YEARS OF THE EVALUATION

Sample	Basic Elementary			Basic Secondary			Pilot Elementary		
	Districts	Schools	Treatment-Control Pairs	Districts	Schools	Treatment-Control Pairs	Districts	Schools	Treatment-Control Pairs
Year One Cross-Sectional Sample	37	74	37	14	28	12	31	55	18
Dropped at End of Year One	-2	-4	-2	-3	-6	-2	-16	-29	-7
Added to Year Two Sample	0	0	0	+8	+16	+10*	+9	+18	+9
Year Two Cross-Sectional Sample	35	70	34***	19	38	20*	24	44	20
Year Two Longitudinal Sample	35	70	34***	11	22	10	15**	26**	11
Dropped at End of Year Two	-11	-22	-11	-6	-10	-6	-7	-14	-7
Year Three Cross-Sectional Sample	24	48	22	13	28	14	17	30	13
Year Three Longitudinal Sample	17	34	17	7	16	8	8	16	8

*Includes one pair in which each school contains separate treatment and control sections.

**Includes unpaired treatment schools retained from Year One.

***Sample shrinkage due to invalid data in one treatment-control pair.

control schools and unpaired treatment schools differed at each grade level. In some school pairs and unpaired schools, only one or two grade levels were represented; therefore, the number of schools used in any grade level analysis may have been somewhat smaller than the total number reported here. In addition, the number of treatment-control pairs in each sample was affected by the special adjustments described above, and therefore was not always identical to the number of districts in the sample.

B. GOALS AND PROCEDURES OF YEAR TWO SAMPLING

Between Years One and Two, several important changes occurred in the evaluation samples. Some changes were forced by circumstances, such as the discontinuation of ESAA funding in certain districts; other changes were designed to improve the samples by including newly funded districts. The major goals in selecting Year Two sample sites were:

- To retain as many as possible of the treatment-control school pairs from the Year One samples.
- To select new treatment-control pairs to replace Year One sample schools dropped because of discontinued ESAA participation.
- To supplement the Year One Pilot Elementary and Basic Secondary samples.
- To eliminate unpaired treatment schools from the Pilot sample, if enough treatment-control pairs could be obtained.

To meet these objectives, sampling procedures were developed for processing the 1974-75 Basic and Pilot awards, which were announced in June 1974. First, awards were analyzed to determine the characteristics of districts, schools, and students remaining from the Year One samples. (It was found that 10 of the Year One districts were not re-funded for Year Two.)

Based on this analysis and on the evaluation goals, the following decisions were made:

- The Basic Elementary sample would not be augmented, since the continuing sample was already more than adequately large.
- New treatment-control pairs of schools would be added to the Basic Secondary and Pilot Elementary samples, and unpaired treatment schools would be dropped from the samples if sufficient numbers of pairs could be obtained.
- No new pairs would be added within districts that participated in the Year One samples, as it was believed important to minimize burden on those districts.
- Student samples would be augmented in continuing schools, for purposes of cross-sectional analysis.
- New samples would be drawn in grades 3 and 10 in continuing schools, so that the same range of grades would be included in each year's cross-sectional samples.

At this point, the applications from all districts (approximately 700) receiving 1974-75 ESAA awards were studied in greater detail, to determine which sites not previously used in the study might be eligible for augmenting the Year Two Pilot Elementary and Basic Secondary samples. In addition, telephone calls were made to the more than 300 districts that showed any possibility of meeting the selection criteria. In these calls, information was obtained concerning (1) the names of schools in which ESAA activities were planned for grades 3 through 5, or 10 through 12; (2) the numbers of students designated to participate in ESAA at those grades; (3) the percentages and types of minority students in each school; and (4) comparative ratings of the schools with respect to students' prior academic achievement and their families' socioeconomic status. Based on information obtained from the phone calls and grant applications, and on the Year Two sampling objectives, three evaluation samples were defined at the start of the 1974-75 school year.

The fourth and fifth rows of Table II-1 summarize the final compositions of the Year Two cross-sectional and longitudinal samples (district- and school-level), and the preceding two rows itemize the sample deletions and additions between Years One and Two that led to the final Year Two totals.* The following paragraphs discuss the sampling procedures by which the Year Two samples were derived.

1. BASIC ELEMENTARY SAMPLE

No new districts or schools were added to the Year Two Basic Elementary sample, as 35 districts containing treatment-control school pairs were retained for the longitudinal sample. All fourth- and fifth-grade students still available from the Year One sample were retained in the study for the longitudinal student sample. A new third-grade sample was drawn in each school, using procedures identical to those employed in Year One (i.e., random selection across sections within grade). At grades 4 and 5, new students were sampled to offset the effects of sample attrition. All of these newly added students were included in the Year Two cross-sectional sample (but not, of course, in the longitudinal sample).

2. BASIC SECONDARY SAMPLE

The longitudinal sample of Basic Secondary districts contained 10 treatment-control pairs of schools. This sample was augmented for cross-sectional purposes by the addition of pairs of schools from eight newly funded districts. The selection of these districts exhausted the pool of districts that met the sampling criteria. Students in newly selected districts and replacement students in the longitudinal sample of schools were selected as described above.

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*In determining school counts for this table, a feeder-fed school combination was counted as a single school, as was a school having both a treatment and a control section. However, in the figures for treatment-control school pairs, a school having a treatment and a control section was counted as if it were an actual pair of schools.

3. PILOT ELEMENTARY SAMPLE

The longitudinal sample as defined at the start of Year Two consisted of 11 Pilot districts, each with the same treatment-control school pair that participated in the Year One evaluation. Sampling of new third-grade and replacement fourth- and fifth-grade students was conducted as described above.

The Year Two cross-sectional sample of districts and schools consisted of the longitudinal sample plus newly added sites. Specifically, nine new districts, each with a treatment-control school pair, were added to the Pilot sample. Procedures identical to those for Year One were used to select each pair of schools, to assign those schools to treatment and control conditions, and to select sample students within the schools.

Only four unpaired Pilot treatment schools and their corresponding four districts were retained from the Year One sample. These unpaired schools were needed to fill out the cross-sectional sample, which fell short of the desired 25 pairs of treatment and control schools.

C. GOALS AND PROCEDURES OF YEAR THREE SAMPLE DEFINITION

The main concern of the sampling plan in Year Three was the collection of data that could be used to explore possible long-term effects of the ESAA funding. While many new districts received ESAA funding for the first time during the 1975-76 school year, and could have been added to the samples, the design of the evaluation focused on the schools that had been funded previously.

The major goals of the Year Three sampling plan were:

- To retain as many as possible of the schools that had participated in the previous years of the evaluation.
- To retain as many as possible of the students who had participated in either the elementary longitudinal cohort (beginning as third-grade

students in the 1973-74 school year) or the secondary longitudinal cohort (beginning as tenth-grade students in the 1973-74 school year).

- To select new samples of students at the lower grades for purposes of the cross-sectional analyses.

To meet these goals, the 1975-76 awards were reviewed to determine which of the participating districts and schools had been re-funded. It was crucial to the longitudinal objectives of the evaluation to determine whether enough participating schools in each evaluation sample had received continuous funding to make the longitudinal analysis viable. Initial review showed that the majority of schools had been re-funded. Based on this preliminary analysis, the following decisions were made:

- No additional schools would be selected for any evaluation samples; rather, attention would focus on the long-term effects of ESAA funding.
- A school would be dropped if the grade levels of its ESAA program had changed so that one or none of the target grades were now participating in the program.
- Treatment pairs (i.e., pairs of ESAA-funded schools for which there were no paired control schools) at the secondary level would be dropped, as the analyses would focus on treatment-control comparisons.
- Student samples would be augmented at grades 4, 5, 11, and 12 for purposes of the cross-sectional analyses.
- New third-grade or tenth-grade samples would be drawn in schools with continuing programs at those grade levels, for purposes of the cross-sectional analyses.

In reviewing the grant applications, it was found that a substantial number of treatment schools had changed their ESAA programs between Year Two and Year Three. The most frequent change involved a shift in the grade levels at which the program was operating. In these cases, target grades that were no longer participating were dropped, and the corresponding grades in the paired control school were also dropped.

A second problem concerned the longitudinal cohorts at both elementary and secondary levels. In several schools with relatively small programs (i.e., a small number of participating students) in Year One, the number of continuing students was becoming so small that estimates of program performance based on their outcome scores would be unreliable. A decision was made to drop from the longitudinal analysis any school in which the longitudinal cohort had fewer than five continuing students.

Based on the review of applications, and on the sampling decisions described above, the final samples were defined. A summary of the composition of the Year Three samples for the three evaluation universes appears in Table II-1. The last two rows of the table show the final composition of the Year Three cross-sectional and longitudinal samples, and the preceding row itemizes the sample deletions between Years Two and Three that produced the Year Three totals. The following paragraphs briefly discuss the procedures by which the Year Three samples were derived.

1. BASIC ELEMENTARY SAMPLE

The Basic Elementary sample is unique among the three evaluation samples, in that all districts and schools in the Year Three sample had participated in the evaluation since Year One. Of the 22 pairs of schools used in the Year Three cross-sectional analysis, 17 had students in the longitudinal cohort of fifth graders. Of the five pairs of schools not represented in the longitudinal analysis, three no longer had an ESAA program at the fifth-grade level in the treatment school in Year Three, and two had failed to provide valid pretest or posttest data in a previous year.

2. BASIC SECONDARY SAMPLE

The 14 pairs of schools in the Year Three Basic Secondary cross-sectional sample included 9 of the 12 present in Year One. However, in the treatment school of one pair of continuously funded schools, students in the longitudinal cohort were still participating in ESAA; therefore, this pair was not represented in the longitudinal analysis.

3. PILOT ELEMENTARY SAMPLE

Of the 24 districts in the Year Two sample, 17 were re-funded in Year Three and still had ESAA programs in the target grade levels. However, four of these districts had only a single treatment school; although not used in the impact analyses, these four were kept in the sample in order to provide better descriptive data on Pilot programs, and because some of them were important for the in-depth analyses.*

Of the 13 treatment-control pairs that provided valid outcome data for the cross-sectional analyses, 9 pairs had been in the Year One sample and were part of the longitudinal school sample. One of these pairs, however, had insufficient numbers of continuing fifth-grade students, and was therefore dropped from the longitudinal analysis.

For purposes of the cross-sectional analysis, new students were sampled at grades 4 and 5 to augment the sample of continuing students, and to offset the effects of sample attrition. A new third-grade sample was selected in treatment and control pairs that had a treatment program at that grade level.

D. DISCUSSION OF FINAL SAMPLES

In Year Two it was not possible to obtain definitive evidence concerning the generalizability of the cross-sectional samples to their respective award universes, primarily because of the unavailability of detailed data on the award universes. Analyses appeared to show that the samples reflected the characteristics of the award universes, within certain known sampling constraints.* For example, the samples of districts were representative of their award universes in all major characteristics examined except total enrollments. Medium- and large-sized districts were overrepresented because of the emphasis on selecting districts that could provide matched schools for assignment to the treatment and control conditions. Also, samples of participating students tended to contain larger proportions of minority students than did the districts from which those students were drawn. This finding probably resulted from the ESAA resource allocation process itself, with the most disadvantaged students targeted to receive services, and did not necessarily mean that sample students were unrepresentative of the universes of ESAA-eligible students.

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*See An In-Depth Study of Emergency School Aid Act (ESAA) Schools: 1975-76. System Development Corporation, TM-5236/013/00, March 1977.

The sampling strategy for Year Three, with its emphasis on retaining districts and schools that had participated in Year Two (rather than adding new participants), restricted the generalizability of the samples by one further condition. Districts and schools in the Year Three sample were representative of the subset of the Year Two awardees that were also funded in Year Three. To the extent that the Year Two sample was generalizable to any given universe of interest, the Year Three sample represented that same interest universe. There is no evidence to suggest that the samples retained in the third year were systematically different in any respect other than continued funding. The characteristics of the sample districts and schools for Years Two and Three are presented in Chapter III. Chapter IV describes the demographic characteristics of the samples of students in those schools; these data again indicate few, if any, systematic shifts between the two years' samples.

The samples of students comprising the longitudinal cohorts were of particular interest to the analysis and interpretation of the long-term impact data. These samples were defined by the districts and schools that met the sampling criteria for Year One,* and that had ESAA programs at all three target grades, and that received ESAA funding in all three years of the evaluation. Analysis of the characteristics of the districts and schools participating in all three evaluation years (see Chapter III) did not, in general, reveal substantial differences between the three-year longitudinal and the first-year cross-sectional samples.** Sample students starting in Year One at grade 3 or 10 (i.e., students defining the intended longitudinal cohorts) were selected randomly across classes within these schools, and thus were representative of the universe of ESAA-eligible students meeting the sampling criteria in Year One.

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*See The Second Year of Emergency School Aid Act (ESAA) Implementation, Chapter II, pp. 14-22.

Student-level attrition had two important ramifications for any analyses of the longitudinal sample data. The first and most important ramification related to the comparability of the treatment and control samples over the three-year period. If differential attrition occurred between the treatment and control cohorts (which had been initially matched) within any given evaluation sample, then any differences in performance would be confounded by sample bias due to the differential attrition. The second possible ramification of attrition concerned the overall change in the sample characteristics, and the comparability of the resulting sample to any universe of interest. If attrition over the three years changed the sample so that it had no meaningful and comparable reference group, then the results of any growth in this group would be of very little interest.

Addressing first the issue of overall sample change due to attrition, several analyses of the data relevant to the longitudinal cohorts were performed. One analysis concerned the overall attrition rate in the longitudinal sample. If too few students remained at the end of three years to provide stable estimates of overall growth or of program effects, then there would be little point in conducting these analyses. Table II-2 below represents the evolution of the longitudinal cohorts in each evaluation sample. The column labeled "Year One Cross-Sectional" indicates the number of students in each sample who participated in the Year One pretest and were then at the lowest target grade level appropriate to their sample. In some respects, this column shows the potential pool for the longitudinal cohort. This group, however, contained students in a number of schools that were not considered in the longitudinal comparisons. Such schools included unpaired treatment schools, schools with fewer than three participating grades, and schools that were not funded in the second or third years. Therefore, the figures were adjusted by removing these schools; the adjusted values appear in Table II-2 under the heading "Year One Longitudinal," and represent the lowest-grade-level students in matched treatment-control schools that contained all three grade levels of interest, and that participated continuously in the study.

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*See The Second Year of Emergency School Aid Act (ESAA) Implementation, Chapter II, pp. 1-3.

**Basic Secondary districts in the longitudinal sample had higher percentages of minority students than did districts in each year's cross-sectional samples. The school samples, however, were very similar.

TABLE II-2. STUDENT RETENTION IN THE THREE-YEAR LONGITUDINAL SAMPLE

Sample	Grade	Year One Cross-Sectional	Year One Longitudinal	Year Three Longitudinal
Basic Elementary	3	3278	1986	904
Basic Secondary	10	1037	558	177
Pilot Elementary	3	1100	681	302

The final column ("Year Three Longitudinal") represents those students for whom complete data were available over the three-year period. These students defined the three-year longitudinal cohorts. Both elementary samples exhibited approximately 45 percent retention, while about one-third of the secondary students remained through the end of the study. It is clear that the numbers of students remaining were sufficiently large to provide stable estimates of overall growth over time, and in fact, were somewhat larger than might have been expected for highly disadvantaged schools.

Analyses of the demographic characteristics of the longitudinal cohorts, and comparisons of these characteristics against the cross-sectional samples, are presented in Chapter IV, and analyses of the trends in the longitudinal outcome data are described in Chapter VI. It is important to note at this point that differences between the longitudinal and cross-sectional samples were generally not large, and did not seem to indicate that the sample had become extremely specialized and uncharacteristic.

Next, possible attrition effects on the comparability of the treatment and control schools were examined. The analyses of treatment and control differences in student demographic characteristics in each of the longitudinal cohorts, presented in Chapter IV, indicated no systematic or meaningful differences. An analysis of the differential rates of attrition did show that control groups generally had somewhat higher retention rates than treatment groups. This difference may have been caused by the definitions of control (ESAA-eligible) and treatment (ESAA-participating) groups; that is, over the years, greater numbers of students may have falled outside the more restrictive "participating" designation, than outside the "eligible" designation. However, since there was no evidence of any concomitant difference in sample characteristics, no systematic bias in the sample can be inferred.

In summary, the longitudinal cohorts appear to provide no evidence of differential attrition between the treatment and control groups that would bias the longitudinal comparisons between the two groups. Furthermore, the longitudinal groups in general, while unique in their stability, seem to be representative samples of students defined by the Year One sample selection criteria, and as such provide useful data on academic growth over time for this evaluation and for similar studies of disadvantaged students.

CHAPTER III

DEMOGRAPHIC CHARACTERISTICS OF SAMPLE DISTRICTS AND SCHOOLS

> This chapter examines certain characteristics of the Year Three sample districts and schools, and of the total student bodies within those districts and schools. (Chapter IV, by contrast, focuses exclusively on the particular students in the evaluation samples.) Overall, the Year Three district samples, like those of the previous years, tended to have their greatest concentration in the Southeastern and South Central portions of the country. Minority students, mostly black, accounted for over three-fourths of total enrollments in Pilot sample districts, one-third in Basic Elementary sample districts, and one-fourth in Basic Secondary sample districts. Racial/ethnic compositions of the Year Three sample districts were generally similar to those for Year Two, though the Pilot sample showed a moderate increase in Spanish-background students. All three samples had substantial numbers of disadvantaged students, as indicated by the percentages of students judged eligible for Title I services (approximately 65 percent in Pilot Elementary schools, 43 percent in Basic Elementary schools, and 23 percent in Basic Secondary schools). In the Basic Elementary and Pilot elementary samples, but not in the Basic Secondary samples, the sample schools had larger percentages of minority students than did the districts from which those schools were drawn. There were no statistically significant differences between paired treatment and control schools, in any of the three evaluation samples, with respect to the variables examined in this chapter.

Several demographic characteristics of the Year Three sample districts and schools, including their geographic location, racial/ethnic composition, enrollment size, and percentage of disadvantaged (i.e., Title I-eligible) students, are summarized in this chapter. Where feasible and appropriate, data for the Year Three cross-sectional samples and three-year longitudinal samples are compared with corresponding figures for the Year One and/or Year Two samples, to show temporal changes in sample composition.

It will be noted that district-level and school-level sample sizes differ among some of the tables presented in this chapter. These variations reflect the fact that some districts and schools declined or were unable to respond to certain questionnaire items, particularly with respect to racial/ethnic percentages among students or staff.

A. GEOGRAPHIC LOCATION OF SAMPLE DISTRICTS

This section describes the geographic distributions of districts in the Year Three cross-sectional and longitudinal samples, and compares those distributions with the Year Two cross-sectional sample distributions. As in previous reports, results are presented separately for districts in the Basic Elementary, Basic Secondary, and Pilot Elementary samples.

1. BASIC ELEMENTARY SAMPLE

Table III-1 shows the frequency and percentage of Year Two cross-sectional and Year Three cross-sectional and longitudinal sample districts in the ten HEW geographic regions. (A list of the states contained in each of the HEW regions can be found in Appendix III-A.) Districts in the Basic Elementary sample were, as in previous years, most heavily concentrated in Regions IV (Southeast) and VI (South Central), while there was no representation from Regions I (New England), VIII (Western Mountain), or IX (Pacific Southwest).

Compared with the Year Two distribution, the Year Three sample had relatively greater representation (i.e., larger percentages of the total sample) from Regions III (Mid-Atlantic), V (North Midwest), and VI (South Central), and smaller percentages from Regions II (Metropolitan Northeast), IV (Southeast), and IX (Pacific Southwest). Most of the shifts in percentages were fairly moderate in size, and there is no *a priori* reason to expect that these would have had major overall impact on the sample students' average achievement scores or socioeconomic status. The changes in geographic distribution of the sample districts appear generally to have counterbalanced each other, at least with respect to certain key descriptive characteristics. For example, districts from Regions IV and VI tended to have similar achievement scores and socioeconomic status in Year Two, and Year Three's percentage drop in

TABLE III-1. REGIONAL DISTRIBUTION OF SAMPLE DISTRICTS*

HEW Region	Basic Elementary Sample		Basic Secondary Sample			Pilot Elementary Sample		
	Year Two	Year Three	Year Two	Year Three		Year Two	Year Three	
	Cross-Sectional	Cross-Sectional and Longitudinal**	Cross-Sectional	Cross-Sectional	Longitudinal	Cross-Sectional	Cross-Sectional	Longitudinal
II Metropolitan Northeast	3(8.6)	1(4.5)	0	0	0	3(12.5)	1(6.7)	0
III Mid-Atlantic	2(5.7)	2(9.1)	1(5.3)	2(15.4)	1(14.3)	4(16.7)	2(13.3)	2(25.0)
IV Southeast	11(31.4)	5(22.7)	9(47.4)	5(38.5)	3(42.9)	7(29.2)	5(33.3)	3(37.5)
V North Midwest	3(8.6)	3(13.6)	3(15.8)	3(23.1)	1(14.3)	1(4.2)	1(6.7)	1(12.5)
VI South Central	10(28.6)	8(36.4)	4(21.1)	2(15.4)	2(28.6)	4(16.7)	3(20.0)	0
VII Central Midwest	2(5.7)	1(4.5)	0	0	0	0	0	0
VIII Western Mountain	0	0	1(5.3)	0	0	1(4.2)	0	0
IX Pacific Southwest	1(2.9)	0	1(5.3)	1(7.7)	0	4(16.7)	3(20.0)	2(25.0)
X Pacific Northwest	3(8.6)	2(9.1)	0	0	0	0	0	0
Total Sample	35	22	19	13	7	24	15	8

*Cell entries show numbers of districts, with percentages in parentheses.

**All Basic Elementary districts in the Year Three cross-sectional sample were also in the longitudinal sample.

district representation from Region IV almost exactly equaled the percentage increase in representation from Region VI. However, it is impossible to assess the effects of sample changes on more complex relationships, such as interactions between program characteristics and outcome measures.

Table III-2 presents data on the geographic distribution of the Year Three ESAA award universe, i.e., the total population of districts receiving ESAA Basic and Pilot grants in 1975-76. Comparing this table with Table III-1, it can be seen that the Basic Elementary sample and the Basic award universe followed generally similar patterns, with both the sample and the award universe concentrating around three-fifths of their districts in Regions IV and VI. However, districts from Regions VII (Central Midwest) and X (Pacific Northwest) were somewhat overrepresented in the sample, while districts from Regions VIII (Western Mountain) and IX (Pacific Southwest) were underrepresented. Again, it is difficult to assess the impact of these differences on the Year Three findings, but the pattern of differences does not suggest a large overall effect of sample bias on major outcome dimensions.

2. BASIC SECONDARY SAMPLE

In the Year Three cross-sectional Basic Secondary sample, five of the ten HEW regions were represented, while only four regions were represented in the three-year longitudinal sample. However, all regions not represented in the cross-sectional sample had only small representation (less than 6%) in the Year Three award universe (see Table III-2). Largely because of the small total number of sample sites at the secondary level, geographic distributions of the sample and award universe were only roughly similar in pattern. The major deviations were in Region V (North Midwest), which was substantially overrepresented in the sample, and Region VI (South Central), which was equally underrepresented. The three-year longitudinal sample was somewhat similar in distribution to the Year Two cross-sectional sample, but differed from the Year Three sample in having smaller district representation from Region V (North Midwest) and appreciably greater representation from Region VI (South Central). The three largest

TABLE III-2. REGIONAL DISTRIBUTION OF YEAR THREE AWARD UNIVERSE*

HEW Region	Basic Awards	Pilot Awards
I New England	5 (1.1)	2 (1.1)
II Metropolitan Northeast	27 (5.8)	10 (5.6)
III Mid-Atlantic	42 (9.0)	16 (8.9)
IV Southeast	132 (28.2)	46 (25.7)
V North Midwest	31 (6.6)	9 (5.0)
VI South Central	154 (32.9)	68 (38.0)
VII Central Midwest	8 (1.7)	5 (2.8)
VIII Western Mountain	24 (5.1)	8 (4.5)
IX Pacific Southwest	38 (8.1)	14 (7.8)
X Pacific Northwest	7 (1.5)	1 (0.6)

*Cell entries show numbers of districts, with percentages in parentheses.

percentage shifts in geographic distributions of cross-sectional sample districts between Years Two and Three occurred in Regions III, IV, and V. Regions III (Mid-Atlantic) and V (North Midwest) increased in percentage representation, while Region IV (Southeast) decreased.

3. PILOT ELEMENTARY SAMPLE

Six regions were represented by districts in the cross-sectional sample, with the largest numbers of districts being in Regions IV (Southeast), VI (South Central), and IX (Pacific Southwest). The percentage distribution was generally similar to that for Year Two, with the largest change being a drop in proportion of districts from Region II (Metropolitan Northeast). The sample distribution was also roughly similar to the regional distribution of the Pilot award universe (see Table III-2), despite some percentage overrepresentation of districts from Region IX and underrepresentation of Region VI.

The regional distribution for the three-year longitudinal sample differed fairly markedly from the Year Two and Year Three cross-sectional samples. While district representation from Region IV (Southeast) was almost two-fifths of the total longitudinal sample, and Region IX (Pacific Southwest) provided another fourth, no districts from Region VI (South Central) were included.

4. SUMMARY OF SAMPLES' GEOGRAPHIC CHARACTERISTICS

For all three of the Year Three cross-sectional samples, more than half the districts were from Regions IV (Southeast) and VI (South Central). This same concentration of districts in southern regions also occurred in the Year Three ESAA award universe and in the Year One and Year Two evaluation samples. Although there were some percentage shifts in geographic distributions of the samples between Years Two and Three, the size and pattern of those shifts do not suggest a major qualitative change in the makeup of the districts being studied.

The Pilot Elementary and Basic Secondary longitudinal samples were quite small (eight and seven districts, respectively), and both differed substantially in regional distribution from the Year Three cross-sectional samples. For the Basic Elementary sites, the longitudinal sample and the Year Three cross-sectional sample of districts were identical.

B. RACIAL/ETHNIC COMPOSITION OF SAMPLE DISTRICTS AND SCHOOLS

1. SAMPLE DISTRICTS

District student body racial/ethnic composition, which was an important factor in determining the districts' ESAA award eligibility, is summarized below by HEW region for each evaluation sample. In addition, the racial/ethnic composition of the district staffs is described and contrasted with that of the students. Finally, changes in the sample districts' racial/ethnic composition between Years Two and Three are discussed.

Two special points about the data should be noted. First, the numbers of sample districts for some regions were quite small, and some districts provided only incomplete data on racial/ethnic composition. As a consequence, the racial/ethnic figures shown here are probably indicative of broad geographic patterns, but may not accurately represent the universe of ESAA-funded districts in a given region. Second, unless otherwise noted, the reported statistics are based upon the distribution of district percentages derived from all sample districts, without weighting for district enrollment. (Spot checks indicated that such weighting would have only small effects on the figures reported here.) Thus, for example, a median value for percentage of Black students represents the midpoint in the distribution of such percentages for all districts in the particular sample being examined.

a. Basic Elementary Sample

Table III-3 presents the Year Three percentages of minority-group students, professional staff, and clerical staff for districts in the three evaluation

TABLE III-3. DISTRICT MINORITY-GROUP PERCENTAGES, BY HEW REGION (YEAR THREE CROSS-SECTIONAL SAMPLES)

HEW Region	Category	Basic Elementary (N=22)			Basic Secondary (N=13)			Pilot Elementary (N=15)		
		District Percentages		Number of Districts Reporting	District Percentages		Number of Districts Reporting	District Percentages		Number of Districts Reporting
		Median	Range		Median	Range		Median	Range	
II Metropolitan Northeast	Students			*						*
	Prof. Staff			*				10.6		1
	Clerical			*				40.0		1
III Mid-Atlantic	Students	63.5	30-97	2	52.0	7-97	2	73.0	71-75	2
	Prof. Staff	28.3		1*	5.9		1*	45.4	31-59	2
	Clerical	14.0		1*	0.0		1*	36.0	22-50	2
IV Southeast	Students	32.0	16-61	5	32.0	16-85	5	79.0	46-99	5
	Prof. Staff	36.7	14-40	5	26.7	14-72	5	48.2	36-88	5
	Clerical	25.0	20-53	5	22.0	7-53	5	36.0	0-43	5
V North Midwest	Students	26.0	20-33	3	19.0	10-25	3	98.0		1
	Prof. Staff	12.7	8-24	3	12.8	6-16	3	46.6		1
	Clerical	19.0	9-35	3	4.0	2-12	3	56.0		1
VI South Central	Students	41.0	28-92	8	53.0	45-61	2	73.0	72-97	3
	Prof. Staff	36.0	15-91	8	37.0	32-42	2	45.2		1**
	Clerical	22.0	0-88	8	37.5	17-58	2	64.5	64-65	2*
VII Central Midwest	Students	22.0		1						
	Prof. Staff	13.4		1						
	Clerical	9.0		1						
IX Pacific Southwest	Students				12.0		1	84.0	75-85	3
	Prof. Staff				8.0		1	46.9	44-53	3
	Clerical				27.0		1	50.0	44-70	3
X Pacific Northwest	Students	24.0	17-31	2						
	Prof. Staff	8.6	8-9	2						
	Clerical	8.0	7-9	2						
Total Sample	Students	33.0	16-97	21*	25.0	7-97	13	75.5	46-99	14*
	Prof. Staff	28.4	8-91	20**	16.6	6-72	12*	46.6	11-88	13**
	Clerical	20.0	0-88	20**	18.0	0-58	12*	43.5	0-70	14*

*,**Number of asterisks indicates the number of sample districts with missing data.

samples, broken down by HEW region. For each sample, table entries show the median and range of minority-group percentages and the number of sample districts on which those figures are based.

Across all regions represented in the district sample, the median percentage of minority-group students was 33 percent, while the corresponding percentages for minority-group professional staffs and clerical staffs were about 28 percent and 20 percent, respectively. As in Years One and Two, regional percentages of minority-group staff members ran consistently below the figures for students. Interdistrict variations in the percentages, as indicated by their ranges, were large. As expected, the median percentage of minority students in Region VI (South Central) was quite high (41 percent). The median percentage of minority students in Region III (Mid-Atlantic, almost 64 percent) was much higher than that in Region IV (Southeast, 32 percent); however, because of the small sample sizes, especially for Region III, the percentages may not accurately represent actual minority composition for ESAA-funded districts in those regions. The smallest minority-group percentages, among those regions having districts in the Year Three sample, were in Regions VII (Central Midwest) and X (Pacific Southwest).

A comparison of the student racial/ethnic composition in the Year Three district sample with that in Year Two is provided in Table III-4. (At the district and school levels, the Year Three Basic Elementary cross-sectional sample was identical to the three-year longitudinal sample.) Mean percentages of students of different racial/ethnic groups are presented for both Years Two and Three, to maximize comparability of the data. Median figures and ranges also were calculated for Year Three, because of the marked degree of skewness in some distributions.

As Table III-4 shows, the mean percentages of students of different racial/ethnic groups remained quite stable between Years Two and Three, despite a sizable district-level attrition. In both years, Whites constituted the largest group, with over half the total enrollments. Blacks were also present in

TABLE III-4. SAMPLE DISTRICT PERCENTAGES OF STUDENTS OF DIFFERENT RACIAL/ETHNIC GROUPS

Sample	Racial/ Ethnic Group	Year Two		Year Three							
		Cross-Sectional		Cross-Sectional				Longitudinal			
		N	$\overline{\%}$	N	$\overline{\%}$	Median	Range	N	$\overline{\%}$	Median	Range
Basic Elementary	White	30	55.3	21	57.5	67.0	3-84	Same as Cross-Sectional			
	Black	30	37.8	21	35.9	30.2	0-96				
	Spanish	30	6.3	21	6.1	0.3	0-86				
	Other	30	0.5	21	0.5	0.1	0-6				
Basic Secondary	White	19	67.2	13	63.8	75.0	3-93	7	49.3	55.0	3-90
	Black	19	28.4	13	31.7	20.0	1-96	7	46.1	41.0	10-96
	Spanish	19	3.9	13	4.1	0.4	0-19	7	4.6	0.4	0-19
	Other	19	0.4	13	0.3	0.2	0-2	7	0.0	0.0	
Pilot Elementary	White	17	27.6	14	21.4	23.0	1-54	8	24.2	25.0	1-54
	Black	17	53.1	14	49.6	57.0	0-99	8	56.1	46.5	0-99
	Spanish	17	13.1	14	22.4	5.5	0-85	8	19.5	1.5	0-85
	Other	17	6.2	14	6.6	0.1	0-89	8	0.1	0.1	0-1

large numbers, with over a third of the enrollments, and Spanish-background students added another six percent. Other racial/ethnic groups (e.g., Asians, Native Americans) contributed less than one percent to enrollments in the sample districts. Median figures for Year Three show larger percentages of White students and smaller percentages of minority students, as compared with the mean. This difference results from a small number of sample districts with very heavy concentrations of minority students.

b. Basic Secondary Sample

Minority students (median of 25 percent) and staff members (around 17 percent) constituted a relatively small percentage of their respective totals in districts composing the Basic Secondary sample. The largest minority student percentages were again in Regions III and VI, followed by Region IV.

Racial/ethnic composition changed little between evaluation Years Two and Three (see Table III-4), with Whites in both years contributing about two-thirds of the sample district enrollment; Blacks, one-fourth; and Spanish-background students, around four percent. As in the Basic Elementary sample, median figures show larger percentages of non-minority students than indicated by the means; this disparity suggests the influence of a few districts with almost exclusively minority enrollments.

The three-year longitudinal district sample shows an appreciably different racial/ethnic composition from that of the Year Two or Year Three cross-sectional sample. Compared with the Year Three cross-sectional sample, for instance, the means of the district enrollments for the longitudinal sample show almost 15 percent fewer White students and 14 percent more Black students. This difference seems to indicate that districts added to the Basic Secondary sample in Year Two (and therefore contributing to the Year Three cross-sectional means but not the three-year longitudinal means) had larger proportions of White students and smaller proportions of Black students than did those districts carried over from Year One.

c. Pilot Elementary Sample

This sample, as expected because of the criteria used in selecting districts to receive Pilot grant awards, had the largest overall percentages of minority group students and staffs, with minority students constituting, on the average, about three-fourths of the sample districts' enrollment (see Table III-3). Of regions for which sample data were available, the largest percentages of minority students were in Regions V (North Midwest) and IX (Pacific Southwest). As Table III-4 shows, student racial/ethnic composition was similar for the Year Two and Year Three cross-sectional samples, though Year Three saw a slight decrease in mean percentages of both Black and White students and a somewhat larger (9 percent) increase in Spanish-background students. Unlike the Basic Secondary sample, the Pilot Elementary sample showed no major differences in percentage composition between the Year Three cross-sectional and longitudinal samples.

2. SAMPLE SCHOOLS

Because school-level eligibility for ESAA funding is based upon need and racial composition, it is reasonable to expect that schools receiving ESAA funds might not be completely representative of their districts with respect to these two attributes. This section presents data on the racial/ethnic composition of the sample schools, as reported by school principals. Again, the descriptive statistics (e.g., means, medians) are based upon the array of school percentages, without weighting for enrollments. Comparisons are drawn between student and staff compositions, and changes in student composition over evaluation years are discussed.

a. Basic Elementary Sample

Table III-5 shows the racial/ethnic composition of students and staff members in the Basic Elementary sample schools for each of the three evaluation years and for the three-year longitudinal sample. In general, the distributions of minority and non-minority students were similar to those in the districts from

TABLE III-5. SCHOOL PERCENTAGES OF RACIAL/ETHNIC GROUPS (BASIC ELEMENTARY SAMPLE)

Category	Racial/ Ethnic Group	Year One		Year Two Cross-Sectional		Year Three Cross-Sectional (N=39)		
		N	$\overline{\%}$	N	$\overline{\%}$	$\overline{\%}$	Median %	Range
Students	White	62	55.7	54	54.8	53.0	59.2	0-88
	Black	62	38.0	54	35.9	40.3	32.7	2-100
	Spanish	62	4.4	54	8.7	5.5	0.4	0-82
	Other	62	2.1	54	0.5	1.2	0.3	0-8
Teachers	White	76	67.8	67	66.1	69.6	70.0	23-100
	Black	76	28.9	67	27.5	27.4	21.0	0-66
	Spanish	76	4.3	67	4.9	2.6	0.1	0-77
	Other	76	1.0	67	1.4	0.4	0.1	0-7
Administrators	White	75	74.8	68	73.3	76.1	96.7	0-100
	Black	76	18.6	68	19.5	18.8	2.5	0-100
	Spanish	75	2.0	68	5.1	5.1	2.7	0-100
	Other	75	3.1	68	0.0	0.0	0.0	-
Clerical Staff	White	75	68.9	70	61.0	66.3	99.0	0-100
	Black	76	22.3	70	28.3	30.6	0.8	0-100
	Spanish	75	5.1	70	7.0	2.6	1.3	0-100
	Other	75	3.4	70	2.2	0.5	0.2	0-18

which these schools were drawn, but there was a trend for the sample schools to have slightly larger percentages of minority students than did their districts (see Table III-4). There was also a slight decrease each year in the mean percentage of White students, probably reflecting changes in the sample of schools more than changes in the student composition of individual schools.

Median percentages as well as means were calculated for Year Three. These tended to run higher than the corresponding mean values for White students and staff members, indicating the presence of a small number of sample schools with very high percentages of minority students or staff. This tendency is particularly noticeable in the categories of school administrators and clerical staff; the mean percentage values were greatly affected by a few schools with almost exclusively minority-group members, while most other sample schools had almost entirely White administrators and clerical staffs. As in previous years, sample schools generally had considerably higher percentages of White faculty and administrators than of White students.

b. Basic Secondary Sample

In comparing Tables III-4 and III-6, it can be seen that the mean percentage of minority students in Basic Secondary sample schools for Year Two was larger than that in the districts from which those schools were drawn. By Year Three, however, the school and district percentages were about equal, and in the three-year longitudinal sample, the schools actually had a higher percentage of White students than did their districts. This trend is difficult to explain, but evidently reflects differential sample augmentation in Year Two and differential attrition in Year Three, with respect to the relative percentages of minority students at the district and school levels.

Overall, White students constituted almost two-thirds of the students in the Year Three school sample, and Black students the other third, with only small percentages of Spanish-background students. Percentages of minority staff

TABLE III-6. SCHOOL PERCENTAGES OF RACIAL/ETHNIC GROUPS (BASIC SECONDARY SAMPLE)

Category	Racial/ Ethnic Group	Evaluation Year									
		Year One		Year Two Cross-Sectional		Year Three Cross-Sectional (N=23)			Three-Year Longitudinal (N=11)		
		N	$\bar{\%}$	N	$\bar{\%}$	$\bar{\%}$	Median %	Range	$\bar{\%}$	Median %	Range
Students	White	26	56.4	29	63.4	63.9	79.7	0-94	57.4	77.0	0-94
	Black	25	41.0	29	31.8	33.1	17.0	1-100	41.4	20.0	6-100
	Spanish	26	0.5	29	1.5	2.3	0.3	0-12	1.2	0.3	0-8
	Other'	25	1.0	28	0.3	0.6	0.1	0-8	0.0	0.0	-
Teachers	White	28	73.4	37	76.2	77.7	82.2	32-97	74.4	81.7	37-97
	Black	28	25.4	37	22.7	20.9	15.0	0-68	25.3	18.0	3-63
	Spanish	28	0.4	37	1.0	1.2	0.2	0-15	0.3	0.1	0-2
	Other	28	0.8	37	0.1	0.1	0.0	0-2	0.0	0.0	-
Administrators	White	28	64.2	36	73.4	70.9	79.2	0-100	66.4	75.0	0-100
	Black	28	33.6	36	25.3	27.0	19.0	0-100	32.9	25.0	0-100
	Spanish	28	0.0	36	0.2	2.2	0.3	0-20	0.6	0.3	0-7
	Other	28	2.2	36	0.0	0.0	0.0	-	0.0	0.0	-
Clerical Staff	White	28	71.6	37	74.3	74.9	95.0	0-100	66.8	80.0	0-100
	Black	28	27.4	37	23.8	24.4	2.3	0-100	33.2	20.0	0-100
	Spanish	28	0.0	37	0.6	0.7	0.2	0-12	0.0	0.0	-
	Other	28	0.9	37	0.0	0.0	0.0	-	0.0	0.0	-

members were lower than those of minority students. As in the Basic Elementary sample, median percentages of White students and staff members ran consistently higher than the corresponding mean values, again indicating a few schools with very high percentages of minority-group members.

c. Pilot Elementary Sample

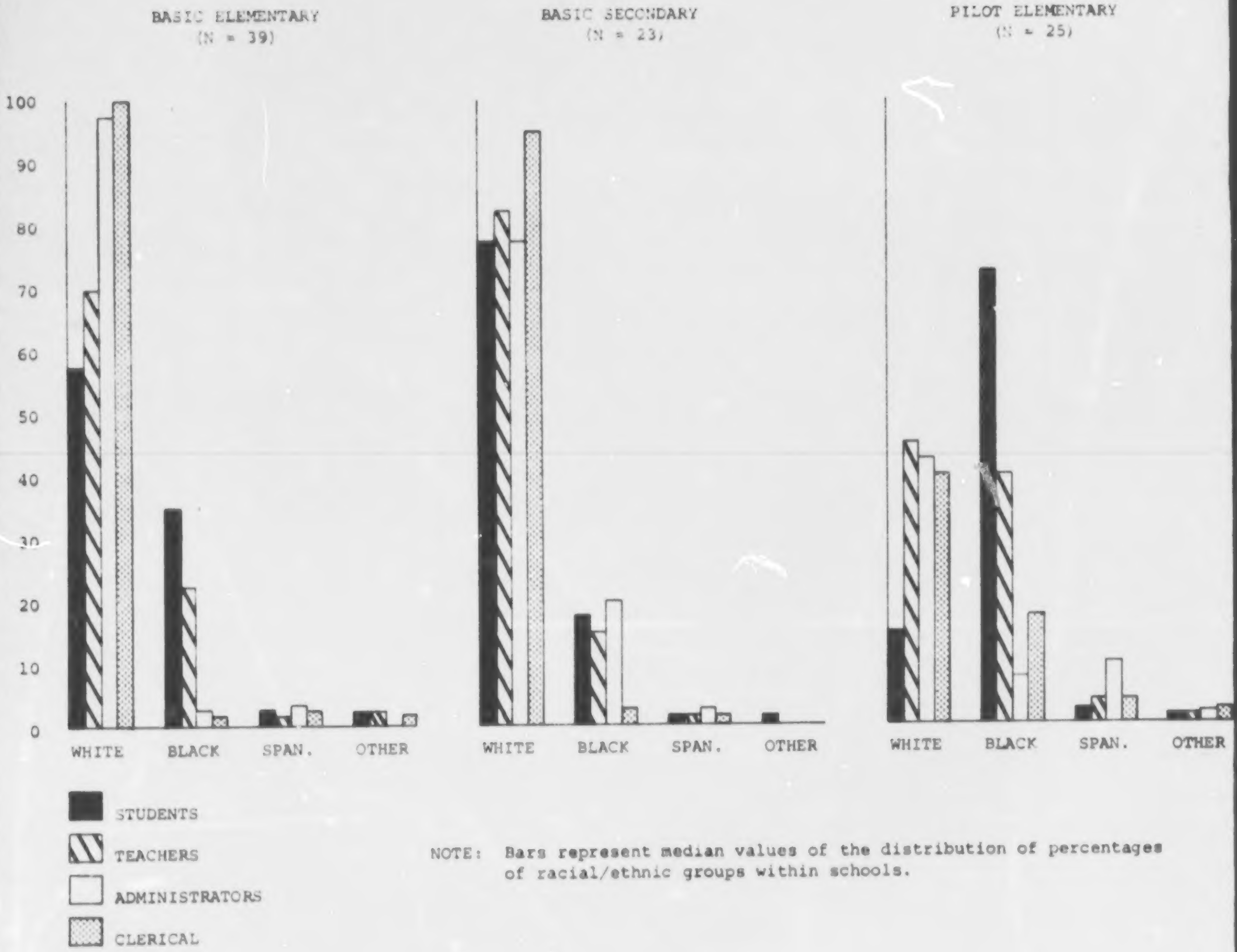
As expected, this sample had schools with the largest percentages of minority students, with about 15 percent in the Year Three sample being White. Comparison of Tables III-4 and III-7 shows that the sample schools had substantially higher percentages of minority students in Year Three than did their districts, while Table III-7 also shows a consistent increase in the percentage of minority students across the three years. Median and mean percentage values differed only slightly, suggesting a fairly normal distribution of the school racial/ethnic percentages for this sample.

d. Summary of School-Level Percentages of Racial/Ethnic Groups in Year Three Sample

Figure III-1 provides a graphic overview of Year Three school-level differences in racial/ethnic composition among the three evaluation samples, and between students and staff members. It can be seen that the median percentage of minority students, especially Black students, was smallest for the Basic Secondary sample, and much larger for the Pilot Elementary sample. Also evident is the finding that the percentages of minority staff members, while fairly consistently lower than the corresponding percentages of minority students, generally followed the same trend across samples as the student percentages. That is, the samples with the largest percentages of minority students also had the largest percentages of minority staff members. This same pattern was found across schools within each sample. There was a positive and, in the case of Basic schools, statistically significant correlation between the percentage of minority students and that of minority staff members. (See Appendix III-B for correlation coefficients and significance levels.)

TABLE III-7. SCHOOL PERCENTAGES OF RACIAL/ETHNIC GROUPS (PILOT ELEMENTARY SAMPLE)

Category	Racial/ Ethnic Group	Year One		Year Two Cross-Sectional		Year Three Cross-Sectional (N=25)			Three-Year Longitudinal (N=16)		
		N	$\overline{\%}$	N	$\overline{\%}$	$\overline{\%}$	Median %	Range	$\overline{\%}$	Median %	Range
Students	White	37	21.8	24	18.1	15.2	14.0	0-40	14.2	12.5	0-40
	Black	37	65.1	24	66.3	55.8	72.0	0-100	68.2	79.5	1-100
	Spanish	37	11.6	24	14.7	24.8	0.4	0-97	17.2	0.7	0-85
	Other	37	1.4	24	0.6	4.2	0.2	0-95	0.3	0.1	0-3
Teachers	White	51	51.8	27	48.5	45.4	45.2	0-85	47.4	56.5	0-35
	Black	50	36.8	37	41.3	37.9	39.8	0-100	44.1	40.5	0-100
	Spanish	50	6.8	37	9.1	16.0	0.9	0-60	7.9	0.6	0-43
	Other	49	0.4	37	1.2	0.6	0.1	0-5	0.6	0.1	0-5
Administrators	White	49	43.0	37	44.9	43.0	40.6	0-100	45.3	12.5	0-100
	Black	51	38.0	37	33.7	31.0	8.3	0-100	42.2	12.5	0-100
	Spanish	48	11.2	37	16.0	24.0	9.7	0-100	9.4	3.6	0-100
	Other	48	[illegible]	37	1.4	2.0	1.0	0-50	3.1	1.7	0-50
Clerical Staff	White	51	48.8	38	41.3	42.0	40.0	0-100	43.1	45.0	0-100
	Black	51	41.2	38	40.6	32.0	16.7	0-100	46.9	41.7	0-100
	Spanish	50	7.1	38	14.0	22.0	1.6	0-100	10.0	2.9	0-100
	Other	50	1.9	38	2.6	4.0	2.1	0-100	0.0	0.0	0



NOTE: Bars represent median values of the distribution of percentages of racial/ethnic groups within schools.

Figure III-1. Median School Percentages of Different Racial/Ethnic Groups in Year Three Cross-Sectional Samples

C. PERCENTAGES OF DISADVANTAGED STUDENTS IN SAMPLE SCHOOLS

The numbers of disadvantaged students in the sample schools provided an index of school socioeconomic status. Principals were asked to indicate the approximate percentages of students in their schools who met the qualifications for participation in the Elementary and Secondary Education Act (ESEA) Title I program. No district-level eligibility figures were available for Year Three.

Table III-8 shows the mean and median percentages of students in the sample schools who were estimated to be eligible for Title I services. Not unexpectedly, the largest percentages for both the Year Three cross-sectional and longitudinal samples were in Pilot schools. Across the two elementary samples (Basic and Pilot), roughly half the students were judged sufficiently disadvantaged to be eligible for participation in a Title I program. Only about a fourth were judged eligible at the secondary level. Overall, the percentage figures for the cross-sectional samples did not differ appreciably from those for the longitudinal samples.

D. DISTRICT AND SCHOOL ENROLLMENTS

The sizes of the districts and schools provide potentially important contextual variables that, in some earlier studies, have been found related to achievement. Table III-9 presents Year Three data on sample district average daily attendance (ADA). Enrollments of sample schools for Years Two and Three are shown in Table III-10.

1. BASIC ELEMENTARY SAMPLE

At the district level, the mean of the ADAs was over 22,000, while the median was only 13,000. As the difference between these two figures suggests, a small number of the sample districts had very large ADAs. (One district reported over 100,000 students.)

TABLE III-8. ESTIMATED PERCENTAGES OF TITLE I-ELIGIBLE STUDENTS IN SAMPLE SCHOOLS

Sample	Year Three Cross-Sectional					Three-Year Longitudinal				
	N		$\overline{\%}$	Median %	Range	N		$\overline{\%}$	Median %	Range
Basic Elementary	38	(86)	42.7	42.5	6-98	Same as Cross-Sectional				
Basic Secondary	22	(85)	23.4	12.0	0-75	10	(71)	23.9	10.0	0-75
Pilot Elementary	25	(93)	65.2	59.7	30-98	15	(94)	59.3	50.4	30-98

NOTE: Cell entries are the numbers and percentages (in parentheses) of schools reporting, and the means, medians, and ranges of the distribution of the estimated percentages of Title I-eligible students within schools.

TABLE III-9. AVERAGE DAILY ATTENDANCE (ADA) OF SAMPLE DISTRICTS IN YEAR THREE

Analysis Sample	Basic Elementary				Basic Secondary				Pilot Elementary			
	N	Mean ADA (Thousands)	Median ADA (Thousands)	Range (Thousands)	N	Mean ADA (Thousands)	Median ADA (Thousands)	Range (Thousands)	N	Mean ADA (Thousands)	Median ADA (Thousands)	Range (Thousands)
Cross-Sectional	21	22.2	13.0	3.5-111.1	12	56.9	32.4	8.5-185.0	15	24.5	7.9	0.6-226.0
Longitudinal	Same as Cross-Sectional				6	65.5	30.4	8.5-185.0	8	40.2	8.6	1.1-226.0

TABLE III-10. SAMPLE SCHOOL ENROLLMENTS
IN YEARS TWO AND THREE

Sample		Year Two Cross-Sectional	Year Three Cross-Sectional	Three-Year Longitudinal
Basic Elementary	N	71	42	Same as Cross-Sectional
	$\bar{X}$	545	569	
	S.D.	216	224	
Basic Secondary	N	44	23	12
	$\bar{X}$	1,489	1,579	1,691
	S.D.	673	629	645
Pilot Elementary	N	44	27	16
	$\bar{X}$	569	628	582
	S.D.	274	247	228

NOTE: Schools with both treatment and control classes are included in both the treatment and control samples, but only once in the total sample.

Both means and medians were calculated for school enrollments, but only means are shown in Table III-10, as the median and mean values were quite similar in all cases. The table also shows that school enrollments for Years Two and Three were very similar, with mean values of 545 and 569, respectively.

2. BASIC SECONDARY SAMPLE

Districts in this sample were considerably larger, on the average, than those in the Basic Elementary sample. For cross-sectional sample districts, the mean was almost 57,000 and the median was around 32,000, compared with figures of 22,000 and 13,000 in the Basic Elementary sample. The large size of the Basic Secondary districts probably results from the sampling requirement that each district selected have at least two similar high schools; districts meeting this requirement would have at least a moderately large enrollment.

In the school samples, also, enrollments at the secondary level averaged much larger than those at the elementary level (almost 1,600 students and under 600 students, respectively, for the Year Three cross-sectional sample). Enrollments in Year Three were slightly higher than those in Year Two, while the mean enrollment for the longitudinal sample was moderately higher than that for either cross-sectional sample. It is likely that most of these variations represent changes in the schools composing the samples, rather than enrollment changes within schools.

3. PILOT ELEMENTARY SAMPLE

District ADAs for the Year Three cross-sectional sample had a mean of around 25,000 but a median value of only 8,000. (One Pilot district had almost a quarter of a million students.) The longitudinal sample had a much larger mean ADA (over 40,000) but a median only moderately larger than that for the cross-sectional sample.

The mean enrollment of Pilot Elementary schools in the Year Three cross-sectional sample was 628. This was slightly larger than the figure for Year Two (569), and also larger than the average enrollment in the longitudinal sample (582).

E. COMPARISON OF DEMOGRAPHIC CHARACTERISTICS OF TREATMENT AND CONTROL GROUPS

A basic premise of the experimental design underlying the impact analyses for this study was that the paired treatment and control schools would be similar in all characteristics except those directly related to the awarding or withholding of ESAA resources. Thus, it was important to determine whether the two groups differed significantly on any of the key demographic variables. Tests of significance (paired t-tests) were performed on treatment-control differences in students and staff racial/ethnic composition, in percentages of Title I-eligible students, and in school enrollments. None of these differences reached the .05 level of significance.

F. SUMMARY

- In each of the Year Three cross-sectional samples, over half the sample districts were from HEW Regions IV (Southeast) and VI (South Central), reflecting the Basic and Pilot award universes' concentration in those two regions. Overall, the Basic Elementary sample resembled its award universe with respect to percentage representation of districts from different regions. Geographic similarities between the Basic Secondary and Pilot Elementary samples and their respective award universes also were evident, but only at a fairly gross level, in part because of the small numbers of districts in those two samples. For example, the Basic Secondary sample in Year Three included districts from only five of the ten regions; and the Pilot sample, from six regions. Although there were some percentage shifts in geographic distributions of the samples between Years Two and Three, the size and pattern of those shifts do not appear to indicate a major qualitative change in the makeup of the districts being studied.

- The median percentages of minority students in Year Three sample districts were 33 percent for the Basic Elementary sample, only 25 percent for the Basic Secondary sample, and over 75 percent for the Pilot Elementary sample. Black students constituted the largest minority group in the sample districts, with Spanish-background students a distant second in numbers.

- As in previous years, percentages of minority staff members were consistently lower for all three samples than were the corresponding figures for minority students. However, there was a significant overall trend for schools with the largest percentages of minority students also to have the largest percentages of minority staff members.

- In all three evaluation groups, the racial/ethnic composition of Year Three sample districts was similar to that for Year Two, though the Pilot sample showed a moderate increase in Spanish-background students.

- In both the Basic Elementary and Pilot Elementary samples, the sample schools had somewhat larger percentages of minority students than did the districts from which those schools were drawn. This difference was not found at the secondary level.

- All three samples had substantial numbers of disadvantaged students, as indicated by the percentages of students judged eligible for ESEA Title I services. The largest percentage of Title I-eligible students was found in Pilot Elementary schools (65 percent); the corresponding percentages for the Basic Elementary and Basic Secondary samples were 43 and 23 percent, respectively.

- Median values of districts' average daily attendance were 13,000 for the Year Three Basic Elementary sample, over 32,000 for the Basic Secondary sample, and almost 8,000 for the Pilot Elementary sample. Average school enrollments for those three samples were 569, 1,579, and 628, respectively.

- There were no statistically significant differences between paired treatment and control schools in any of the three evaluation samples, with respect to student or staff racial/ethnic composition, percentage of

Title I-eligible students, or school enrollment. This finding is consistent with the study's experimental design, which assumes equivalence of the treatment and control groups on dimensions other than those associated with the award or denial of ESAA resources.

CHAPTER IV

STUDENT AND FAMILY CHARACTERISTICS

Summary statistics were generated for several background and entry (pretest) characteristics of the sample students. These statistics provide a partial description of the students being served by sample ESAA projects, a source of mediating variables for subsequent analyses of student outcomes, and a basis for determining the degree of initial matching of students in the treatment and control groups. Minority students constituted about half of the Basic Elementary sample, two-fifths of the Basic Secondary sample, and four-fifths of the Pilot Elementary sample. An acute need for compensatory education services was again evident in Year Three, with pretest mean achievement percentile ranks for the different samples ranging between the 17th and 38th percentiles. There was also evidence that sample students came from families with low socioeconomic status (SES): about a fourth of the Basic students' and half of the Pilot students' fathers had failed to complete high school, and half the fathers had jobs in the service or labor category (the lowest of three categories used). Overall, Pilot sample students had lower achievement pretest scores and came from lower SES families than did Basic sample students. Within the Pilot sample, no appreciable differences were found in the background or entry characteristics of students in the treatment and control groups. In the Basic Elementary and Secondary samples, control schools tended to have higher pretest scores than those of treatment schools; even though few of the differences were statistically significant, the general pattern suggests the need for statistical adjustments in the subsequent impact analyses (discussed in Chapter VI).

This chapter describes several characteristics of the sample students and their families, including parents' education and occupation, family socioeconomic status, and students' racial/ethnic background and initial (pretest) achievement level. Students' perceptions of school climate, as it relates to desegregation and racial interactions, are also discussed. Such information serves at least three purposes. First, on a purely descriptive basis, the data should help to answer such questions as: "What kinds of students are served by ESAA? What are their needs for ESAA services, as evidenced by their socioeconomic status and initial achievement levels? How do Pilot program participants differ from participants in Basic programs?" Second, these data allow comparisons between the Year Three sample students and the sample students from previous years; through these comparisons, insights can be gained concerning attrition effects in the cross-sectional and longitudinal samples. Finally, treatment-control comparisons are provided for each student/family characteristic. These comparisons are extremely important for determining the extent to which the treatment and control groups were matched (or mismatched) at the beginning of the third evaluation year.

Data for this chapter were derived from self-administered questionnaires, some completed by the students and some by the students' teachers. Most of the information on family characteristics was obtained from teachers; thus, the accuracy of such information depends upon the teachers' knowledge about their students.

A. FAMILY CHARACTERISTICS

This description of family background characteristics focuses on parents' education and occupation, and family socioeconomic status. The information on parents' education and occupation was obtained from a questionnaire completed by the teacher for each sample student. Information on the family's socioeconomic status was obtained directly from the student.

A summary of these data categories is presented below in Tables IV-1 through IV-3. It should be noted, however, that all percentage figures in these tables are based on the number of usable responses, rather than on the total number of sample students. Excluded from this count of usable responses are missing data, and parents said to be deceased or absent from the household; also excluded, in the counts for items dealing with type of employment, are cases where a parent was reported as retired or unemployed.

1. BASIC ELEMENTARY SAMPLE

As shown in Table IV-1, about 72 percent of the parents of Year Three sample students were thought to have at least a high school education, in contrast with 63 percent of the Year One mothers and 65 percent of the Year One fathers. The increase in educational level occurred for both minority and non-minority parents; however, almost half the Year Three minority students were believed to have parents who had not completed high school, in contrast with about 15 percent of the White students. The percentage of college graduates among minority parents increased very slightly from Year One to Year Three, while the percentage among White parents decreased somewhat. Minority mothers and fathers appeared to have similar educational patterns (e.g., about six percent were college graduates); by contrast, White fathers were thought to be better educated than White mothers (e.g., 25 percent of the fathers and only 14 percent of the mothers were college graduates).

In general, the Year Three longitudinal sample had more parents who were high school graduates and fewer who had less than a high school education than did the Year One sample. By comparison with the Year Three cross-sectional sample, the longitudinal sample had more parents with less than a high school education, and fewer White parents with a high school education.

In summary, parents of Year Three cross-sectional sample students generally were better educated than their Year One counterparts. The parents of those students who remained in the (longitudinal) sample included more high school graduates and slightly more White college graduates than did the original sample.

Parents' occupations were grouped into three categories: service/operative/labor, clerical/crafts/sales/technical, and professional/managerial, with a fourth category, "housewife," added for women. As in previous years, over half the mothers of Year Three sample students were housewives. Another 22 percent worked in a service/operative/labor capacity, over 18 percent in a

TABLE IV-1. BASIC ELEMENTARY SAMPLE STUDENTS: FAMILY CHARACTERISTICS*

Characteristic	Analysis Sample								
	Year One Cross-Sectional			Year Three Cross-Sectional			Longitudinal		
	Total (N=9508)	Minority (N=5086)	Non-Minority (N=4234)	Total (N=5043)	Minority (N=2437)	Non-Minority (N=2578)	Total (N=1092)	Minority (N=642)	Non-Minority (N=443)
Parent Education									
Mother:	(7039)	(3687)	(3242)	(4195)	(1947)	(2241)	(902)	(514)	(388)
Less than high school	37.1	50.2	22.9	28.1	41.4	16.5	35.6	45.1	22.9
High school	40.1	35.9	44.8	47.7	43.9	51.2	44.8	44.0	45.9
Some college	12.2	8.5	16.3	13.7	8.8	18.0	9.9	6.4	14.4
College	10.6	5.3	16.1	10.4	5.9	14.3	9.8	4.5	16.8
Father:	(5993)	(2827)	(3068)	(3541)	(1470)	(2066)	(751)	(387)	(364)
Less than high school	34.8	50.6	21.0	27.6	46.5	14.1	33.3	48.3	17.3
High school	35.9	35.6	36.3	41.2	38.4	43.2	40.7	40.3	41.2
Some college	12.4	8.0	16.2	13.7	8.7	17.2	10.8	7.2	14.6
College	17.0	5.9	26.5	17.5	6.5	25.4	15.2	4.1	26.9
Parent Occupation**									
Mother:	(7867)	(4017)	(3713)	(4298)	(1969)	(2320)	(930)	(531)	(399)
Housewife	51.4	44.5	58.4	50.3	45.5	54.5	49.0	43.5	56.4
Service/operative/labor	24.1	35.8	12.1	21.7	33.7	11.5	26.2	38.6	9.8
Clerical/crafts/sales/technical	16.9	13.0	21.0	18.5	13.1	23.1	16.0	12.4	20.8
Professional/managerial	7.7	6.6	8.6	9.5	7.8	11.0	8.7	5.5	13.0
Father:	(6030)	(2773)	(3138)	(3229)	(1268)	(1955)	(698)	(344)	(354)
Service/operative/labor	52.2	71.9	35.6	48.6	70.1	34.6	52.9	71.2	35.0
Clerical/crafts/sales/technical	25.1	18.6	30.8	26.9	19.5	31.8	27.2	22.4	31.9
Professional/managerial	22.7	9.5	33.6	24.5	10.4	33.7	19.[illegible]	6.4	33.1
Socioeconomic Status	(9445)	(5041)	(4217)	(4789)	(2335)	(2427)	(1047)	(616)	(420)
Reading-related items	4.34	3.93	4.81	4.60	4.20	4.98	4.74	4.40	5.26
Luxury items***	5.93	5.26	6.71	7.35	6.76	7.94	7.43	6.87	8.31

*For parent education and occupation, table entries represent the percentage of respondents selecting each category; for socioeconomic status, entries represent the average number of items selected by respondents. The number of cases upon which the entries are based is shown in parentheses for each characteristic; the total sample size is provided at the top of each column. "Minority" and "non-minority" numbers do not add up to "total" numbers because some respondents declined to state racial/ethnic category.

**The category, "deceased, retired, or unemployed," is excluded from the number of cases upon which the percentages are based.

***One item fewer in Year One than in Year Three.

clerical/crafts/sales/technical field, and almost 10 percent as professional/managerial employees. Among both minority and non-minority mothers, there was a trend across years toward increasing job status; the percentage of Year One mothers in the professional/managerial category, for example, was under 8 percent. Non-minority mothers working outside the home tended to have higher-status jobs than those of minority mothers, but the differences were fairly small.

Fathers showed no consistent pattern of change in job status across years, with roughly half the fathers remaining in the service/operative/labor category, one-fourth in the clerical/crafts/sales/technical category, and one-fourth in the professional/managerial category. Non-minority fathers tended to have jobs of considerably higher status than did minority fathers. In Year Three, for example, almost 34 percent of non-minority fathers and under 11 percent of minority fathers had professional/managerial jobs. At the other end of the job-status scale, over 71 percent of minority fathers and under 35 percent of non-minority fathers had service/operative/labor positions.

Finally, Table IV-1 presents summary data on two indices of family socioeconomic status (SES). These indices were based on student reports of different types of possessions in the home. The first measure, "SES/reading," was a count of the number of reading-related items (such as newspapers and dictionaries) in the home, out of a possible six. The second measure, "SES/luxury possessions," was a count of the number of convenience or luxury items (telephone, TV, dishwasher, etc.) in the home, out of a possible ten. Mean values for the two scales are reported in Table IV-1.

The absolute values shown for the two SES indices are probably not very meaningful without a baseline for "average" families. However, it is clear that according to student reports, non-minority families had consistently greater numbers of possessions in both categories than did minority families. Also noticeable is a gradual but fairly consistent increase in the levels of the indices (i.e., in numbers of items) across evaluation years.

2. BASIC SECONDARY SAMPLE

Generally speaking, educational levels of mothers and fathers in the Year Three Basic Secondary sample were similar to those in the Basic Elementary sample (see Tables IV-1 and IV-2); however, the secondary minority students had more parents who had attended or graduated from college than did the elementary minority students. Job status for both parents tended to be higher in the secondary-level sample. For example, almost 34 percent of Basic Secondary fathers and under 25 percent of Basic Elementary fathers had professional/managerial jobs. Also, both SES indicators tended to be higher for the Basic Secondary sample than for the Basic Elementary sample.

3. PILOT ELEMENTARY SAMPLE

By most measures of social and economic status examined here, families of Pilot sample students were more disadvantaged than those of Basic Elementary or Secondary students (see Table IV-3). Although similar percentages of Basic and Pilot students' parents had completed high school, considerably smaller percentages of Pilot than of Basic parents had college educations, particularly among the White parents. In Year Three, for example, 17.5 percent of the Basic Elementary students' fathers, but only 4.5 percent of the Pilot Elementary students' fathers, had completed college. Furthermore, larger percentages of Pilot parents had service or labor positions, and smaller percentages had professional or managerial positions. In addition, both SES indices had lower average values for the Pilot sample than for either Basic sample. As in both Basic samples, non-minority families showed higher status than minority families on all indices.

B. STUDENT CHARACTERISTICS

Student characteristics reported in this section include racial/ethnic group, achievement test scores at the beginning of the 1975-76 school year (Year Three), and student perceptions of race-related school climate at the beginning of that year.

TABLE IV-2. BASIC SECONDARY SAMPLE STUDENTS: FAMILY CHARACTERISTICS*

Characteristic	Analysis Sample								
	Year One Cross-Sectional			Year Three Cross-Sectional			Longitudinal		
	Total (N=4277)	Minority (N=1892)	Non-Minority (N=2249)	Total (N=3373)	Minority (N=1190)	Non-Minority (N=1663)	Total (N=375)	Minority (N=199)	Non-Minority (N=138)
Parent Education									
Mother:	(3841)	(1620)	(2104)	(2099)	(747)	(1252)	(251)	(137)	(110)
Less than high school	30.5	42.6	21.5	23.8	33.3	18.5	29.1	38.0	19.1
High school	43.0	38.0	46.5	46.5	40.8	50.2	41.0	36.5	47.3
Some college**	26.5	19.4	32.0	29.7	25.8	31.4	29.9	25.6	33.6
Father:	(3366)	(1241)	(2015)	(1934)	(634)	(1217)	(220)	(106)	(110)
Less than high school	31.3	44.3	23.3	23.6	31.4	19.8	26.8	34.0	20.9
High School	35.9	36.4	35.7	38.7	40.1	38.1	42.7	45.3	39.1
Some college**	32.8	19.3	41.0	37.7	28.5	42.1	30.4	20.7	40.0
Parent Occupation***									
Mother:	(3394)	(1442)	(1858)	(2089)	(781)	(1211)	(244)	(135)	(106)
Housewife	47.1	43.8	49.6	47.9	51.0	46.1	49.2	51.1	47.2
Service/operative/ labor	17.4	28.2	9.5	15.8	22.3	11.6	19.3	24.4	12.3
Clerical/crafts/ sales/technical	19.2	11.4	25.0	21.3	12.0	27.1	16.4	8.1	26.4
Professional/ managerial	16.3	16.7	15.9	15.0	14.7	15.2	15.2	16.3	14.2
Father:	(2724)	(1029)	(1605)	(1734)	(584)	(1061)	(190)	(94)	(92)
Service/operative/ labor	38.1	59.5	24.1	39.0	55.7	30.1	38.9	56.4	20.7
Clerical/crafts/ sales/technical	24.4	21.8	26.0	27.2	23.1	29.0	25.8	24.5	27.2
Professional/ managerial	37.6	18.8	49.8	33.8	21.2	40.9	35.3	19.1	52.2
Socioeconomic Status	(4257)	(1888)	(2234)	(2658)	(1065)	(1472)	(306)	(179)	(123)
Reading-related items	5.03	4.57	5.42	5.07	4.55	5.45	5.08	4.79	5.49
Luxury items****	6.23	5.19	7.13	7.67	6.77	8.32	7.32	6.69	8.17

*For parent education and occupation, table entries represent the percentage of respondents selecting each category; for socioeconomic status, entries represent the average number of items selected by respondents. The number of cases upon which the entries are based is shown in parentheses for each characteristic; the total sample size is provided at the top of each column. "Minority" and "non-minority" numbers do not add up to "total" numbers because some respondents declined to state racial/ethnic category.

**Because of the form of available data, this category includes both college graduates and those who attended college without graduation.

***The category, "deceased, retired, or unemployed," is excluded from the number of cases upon which the percentages are based.

****One item fewer in Year One than in Year Three.

TABLE IV-3. PILOT ELEMENTARY SAMPLE STUDENTS: FAMILY CHARACTERISTICS*

Characteristic	Analysis Sample								
	Year One Cross-Sectional			Year Three Cross-Sectional			Longitudinal		
	Total (N=4990)	Minority (N=4323)	Non-Minority (N=614)	Total (N=3223)	Minority (N=2710)	Non-Minority (N=460)	Total (N=495)	Minority (N=426)	Non-Minority (N=69)
Parent Education									
Mother:	(3238)	(2790)	(427)	(2115)	(1808)	(302)	(388)	(336)	(52)
Less than high school	48.2	51.5	27.9	47.3	49.4	35.1	42.5	44.6	28.8
High school	39.7	38.0	51.3	42.6	41.3	50.7	48.7	46.1	65.4
Some college	6.1	7.1	14.1	7.4	7.0	9.6	7.0	7.1	5.8
College	4.0	3.5	6.8	2.6	2.3	4.6	1.8	2.1	0.0
Father:	(2543)	(2144)	(378)	(1698)	(1425)	(270)	(326)	(277)	(49)
Less than high school	50.1	54.3	27.8	47.5	51.0	28.9	50.6	54.5	28.6
High school	37.8	36.5	45.5	41.1	39.1	51.9	42.0	39.4	57.1
Some college	6.4	5.6	11.1	6.9	6.4	9.6	3.7	3.2	6.1
College	5.7	3.6	15.6	4.5	3.5	9.6	3.7	2.9	8.2
Parent Occupation**									
Mother:	(3841)	(3318)	(501)	(2325)	(1969)	(348)	(380)	(333)	(47)
Housewife	45.5	48.1	58.7	54.8	53.8	60.6	48.2	48.3	46.8
Service/operative/labor	34.5	37.3	17.2	26.8	28.5	17.0	30.5	31.8	21.3
Clerical/crafts/sales/technical	10.8	9.9	16.6	13.1	12.6	15.5	15.[illegible]	13.5	27.7
Professional/managerial	5.2	4.7	7.6	5.4	5.1	6.9	6.1	6.3	4.3
Father:	(2805)	(2387)	(397)	(1731)	(1451)	(276)	(301)	(256)	(45)
Service/operative/labor	73.8	77.3	54.9	69.6	72.4	55.1	67.4	69.9	53.3
Clerical/crafts/sales/technical	17.3	16.0	25.2	22.1	20.3	31.2	22.3	21.1	28.9
Professional/managerial	8.9	6.7	19.9	8.3	7.3	13.8	10.3	9.0	17.8
Socioeconomic Status	(4981)	(4315)	(613)	(3022)	(2548)	(428)	(462)	(400)	(62)
Reading-related items	3.77	3.68	4.33	4.07	4.01	4.36	4.58	4.55	4.79
Luxury items***	5.16	5.03	6.02	6.25	6.19	6.63	6.66	6.59	7.10

*For parent education and occupation, table entries represent the percentage of respondents selecting each category; for socioeconomic status, entries represent the average number of items selected by respondents. The number of cases upon which the entries are based is shown in parentheses for each characteristic; the total sample size is provided at the top of each column. "Minority" and "non-minority" numbers do not add up to "total" numbers because some respondents declined to state racial/ethnic category.

**The category, "deceased, retired, or unemployed," is excluded from the number of cases upon which the percentages are based.

***One item fewer in Year One than in Year Three.

1. RACIAL/ETHNIC COMPOSITION

Information on the racial/ethnic backgrounds of the sample students was provided by the teachers. Each student was placed into one of five categories: American Indian (Native American), Asian-American, Black, Spanish-background, or White. Percentages of sample students falling into these categories are shown in Table IV-4 for each evaluation year and for each sample.

a. Basic Elementary Sample

In the Year Three cross-sectional sample, slightly over half the students were White, another two-fifths were Black, and under six percent were Spanish-background. Across all analysis samples, American Indians and Asian-Americans constituted only minor percentages of the students. The cross-sectional samples showed a slight increase from year to year in the percentage of White students; this finding suggests that both student replacement samples in continuing schools and new student samples in new schools contained a larger percentage of White students than did the Year One sample.

While the percentage of Whites among sample students increased in successive cross-sectional samples, the percentages of White students in the total enrollments of the sample schools were decreasing (see Chapter III, Table III-5). Part of this latter shift may have resulted from changes in the racial/ethnic composition of individual schools; it seems probable, however, that the major factor was the change in schools composing the Basic Elementary samples in the three evaluation years.

As a result of these changes in the racial/ethnic composition of students and school samples, the composition of the student sample became increasingly similar to the composition of the schools. In Year One, minorities were represented much more strongly in the student sample than in the schools from which that sample was drawn; by Year Three, the difference had nearly disappeared.

TABLE IV-4. RACIAL/ETHNIC COMPOSITION OF ESAA SAMPLES (PERCENTAGES)

Evaluation Sample	Racial/Ethnic Group	Analysis Sample			
		Year One Cross-Sectional	Year Two Cross-Sectional	Year Three Cross-Sectional	Longitudinal
Basic Elementary	American Indian	0.4	0.5	0.5	0.6
	Asian-American	1.7	2.3	0.7	0.6
	Black	44.6	40.2	41.8	53.3
	Spanish-background	7.9	9.7	5.5	4.8
	White	45.4	47.4	51.4	40.8
Basic Secondary	American Indian	0.0	0.4	0.4	0.3
	Asian-American	0.1	0.6	0.1	0.0
	Black	44.9	38.8	36.6	57.9
	Spanish-background	0.7	1.5	4.7	0.9
	White	54.3	58.7	58.3	40.9
Pilot Elementary	American Indian	1.9	2.2	3.7	4.6
	Asian-American	0.1	0.5	0.0	0.0
	Black	69.2	66.0	55.0	68.9
	Spanish-background	16.3	16.9	26.8	12.5
	White	12.4	14.3	14.5	13.9

Because the entire longitudinal student sample was part of the Year One cross-sectional sample, it is not surprising that the longitudinal sample, like the Year One sample, had stronger minority representation than did the Year Three cross-sectional sample. However, the divergence between the student sample minority percentages and the total school minority percentages was even greater in the longitudinal sample than in the Year One sample; the figures suggest that proportionally more Black students and fewer White students were retained for the longitudinal sample.

Reasons for changes in the racial/ethnic composition of the longitudinal student sample could include schools leaving the sample, grades within schools leaving the sample, students leaving the school, and students staying in the school but leaving the sample. All of these types of attrition are known to have occurred. However, given the similarity of the distributions of total school populations in the Year One and Year Three cross-sectional samples (see Table III-5), the last two alternatives seem the most likely explanations for compositional changes. If the decline in White students in the longitudinal sample was due to their leaving the school, there must have been a sufficient influx of Whites into the schools to maintain the ethnic composition of the Year Three cross-sectional total school populations. This would suggest, contrary to general belief, a greater rate of transiency among White students than among Black students. Another possibility is that the White students were more mobile with respect to their classification by a given school as "ESAA-participating" (in treatment schools) or "ESAA-eligible" (in control schools). That is, different White students might have been moved into and out of ESAA over the evaluation period, while Black students, once in a program, might have remained in that program. In such a case, fewer Black students than White students would be lost to the longitudinal sample.

b. Basic Secondary Sample

The Basic Secondary cross-sectional sample for Year Three had a larger percentage of White students and smaller percentages of Black and Spanish-background students than did the corresponding Basic Elementary sample, with Whites at the secondary level, constituting about 58 percent of the total sample. However, the percentage of Spanish-background students (4.7 percent) in Year Three represented an appreciable increase over the proportion of such students (1.5 percent) in the Year Two Basic Secondary sample. Sample percentages of White and Spanish-background students and, to a lesser extent, total school percentages of those groups generally increased in successive cross-sectional samples (Tables IV-4 and III-6). There was a corresponding decrease in the percentage of Black students in the schools and in the sample. It would appear that, in contrast with the Basic Elementary sample, the shifts in population within the schools, or school attrition and replacement, resulted in fewer Black students and more White and Spanish-background students in both the schools and the ESAA samples.

The racial/ethnic composition of the schools in the Year Three longitudinal sample was very similar to that for Year One, while comparison of the longitudinal student sample with the Year One cross-sectional sample indicates greater retention of Black students than of White students. Again, possible explanations for the latter finding include a greater transiency rate for White students than for Black students, and greater White student movement into and out of ESAA participation.

c. Pilot Elementary Sample

As Table IV-4 shows, the percentages of minority students, especially Black and Spanish-background, were considerably larger for this sample than for either Basic sample. In the Pilot Year Three cross-sectional sample, for instance, over half the students were Black, another quarter were Spanish-background, and only about 15 percent were White. Although the percentage of White students remained relatively constant over the three evaluation years, the percentage of Spanish-background students increased appreciably in Year Three, and the percentage of Black students decreased. This pattern parallels the changes in total school population across the years (Table III-7) and thus appears to be a function of attrition and replacement of schools. Unlike the two Basic samples, the Pilot sample showed no large difference between the longitudinal and cross-sectional samples with respect to the percentages of minority and non-minority students.

2. INITIAL ACHIEVEMENT TEST PERFORMANCE

All sample students were pretested near the beginning of each school year to obtain initial measures of their reading and mathematics skills. The standardized tests included items on reading vocabulary, reading comprehension, math concepts, math computations, and (at the secondary level only) math problems. Results of these tests are discussed in the following paragraphs.

a. Basic Elementary Sample

Table IV-5 shows percentile ranks and grade equivalents for the mean pretest scores of Basic Elementary students from all three years' cross-sectional samples, as well as from the three-year longitudinal sample. The Year Three pretest scores are based upon data from 4,879 students in the cross-sectional sample and 1,026 students in the longitudinal sample. All elementary students in the longitudinal sample were at grade 5 in the third year of the study (1975-76), as this cohort was the only group that fell within the range of grades tested for all three evaluation years. Data for Black, Spanish-background, and White students are broken out separately. Other groups (Asian-American and Native American) are not shown separately, as their small numbers do not permit meaningful summary statistics.

It should be noted that two different levels (Level 2 and Level 3) of the reading and math tests were administered at the fourth grade in Year Three, with

TABLE IV-5. BASIC ELEMENTARY SAMPLE: PRETEST ACHIEVEMENT SCORES

Analysis Sample	Racial/ Ethnic Group	Total Reading								Total Math							
		Grade 3		Grade 4, Level 2		Grade 4, Level 3		Grade 5		Grade 3		Grade 4, Level 2		Grade 4, Level 3		Grade 5	
		Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.
Year One Cross-Sectional	Total	35	2.6			28	3.1	29	4.0	22	2.4			21	3.2	27	4.2
	Black	20	2.1			14	2.4	17	3.2	26	2.5			21	3.2	22	3.9
	Spanish	21	2.7			30	4.1	I.N.	I.N.	40	2.8			30	3.5	40	4.7
	White	55	3.2			47	3.9	49	5.0	48	3.0			46	3.9	[illegible]	5.0
Year Two Cross-Sectional	Total	37	2.7			31	3.2	29	4.0	22	2.4			23	3.2	19	3.8
	Black	26	2.3			16	2.5	17	3.2	13	2.0			14	2.8	14	3.5
	Spanish	33	2.4			26	2.9	19	3.3	28	2.6			23	3.2	18	3.8
	White	46	2.9			47	3.9	45	4.9	31	2.6			31	3.5	28	4.2
Year Three Cross-Sectional	Total	38	2.7	27	3.0	31	3.2	33	4.2	23	2.4	22	3.2	25	3.3	23	4.0
	Black	35	2.4	21	2.8	16	2.5	19	3.3	15	2.1	14	2.8	18	3.0	15	3.6
	Spanish	32	2.5	28	3.1	21	2.7	24	3.7	18	2.2	22	3.2	21	3.2	21	3.9
	White	44	2.9	36	3.4	49	4.0	47	5.0	33	2.7	32	3.6	34	3.6	33	4.4
Longitudinal	Total							29	4.0							21	3.9
	Black							17	3.2							14	3.5
	Spanish							24	3.7							21	3.9
	White							49	5.0							33	4.4

randomization procedures to determine which level was given to each student. According to the test publisher, Level 2 is appropriate for both grades 3 and 4, while Level 3 is appropriate for grades 4 and 5. The publisher's norming tables supposedly provide equating at grade 4 of scores from the two different test levels, so that both levels will produce comparable (normed) results. However, there was evidence from the ESAA evaluation data in Years One and Two of a discontinuity in the progression of the sample students' test scores across grade levels. Students posttested as third-graders in Year One, using test Level 2, showed lower-than-expected (or, for some subsamples, higher-than-expected) scores when pretested as fourth-graders in Year Two, using test Level 3. It was suspected that the two test levels had differences in difficulty for the sample students that were not fully compensated for in the publisher's norming tables. It was further speculated that the failure of the publisher's national norms to equate scores for the two levels resulted from the publisher's use of a norming group heavily weighted with "average" students, whereas the ESAA students represent the low extreme of the national student population; at such an extreme, national norms often have very low precision.

Table IV-5 shows clearly that the fourth-grade sample students' test results for the two reading test levels were, indeed, quite disparate. The direction of disparity appears to depend upon the level of performance of the subsample involved. Students with generally lower scores (regardless of test level) attained higher percentiles and grade equivalents on test Level 2 than on Level 3, whereas students with higher scores (relative to other ESAA sample students) showed better performance on Level 3. Differences between levels in mathematics were minor by comparison.

Because of this apparent inequity in ESAA students' scores for the two test levels, a special restandardization study was conducted in Year Three, using fourth-grade data for both Level 2 and Level 3 to develop new standardization scores that would ensure better equating of the ESAA sample students' scores for the two levels. These new scales were not used for the data in Table IV-5, as the goal here was simply to relate the sample students' pretest performance to the publisher's national norms. However, restandardized scores with equating across test levels, as well as across alternate test forms, were used for all subsequently reported analyses in which achievement scores were related to the experimental variable (i.e., the impact analyses) or to other program variables (i.e., the relational analyses). The restandardization procedures and results are briefly summarized in Chapter VI ("Program Impact") and more fully detailed in Appendix VI-A.

Turning now to some of the more general trends in the pretest data for the Basic Elementary sample, an acute need for compensatory education services was again apparent among sample students in Year Three, as in previous evaluation years. Mean percentile ranks in reading for the total Year Three cross-sectional sample ranged from the 27th percentile (grade 4) to the 38th percentile (grade 3); percentile ranks in math were even lower, and were fairly constant across grade levels, around the 23rd percentile. Rankings of minority students were generally lower than those of non-minority students. This difference is in large measure attributable to socioeconomic differences between the two groups of students; as noted above, sample minority students generally came from families of lower SES than did non-minority students.

There was a general pattern of slightly higher pretest scores in each successive evaluation year (excluding the math test at the fifth-grade level). This pattern probably reflects changes in sample composition rather than changes within a fixed set of schools or students. (This finding is further examined in Chapter VI, which traces the successive test scores of students in the longitudinal sample over three years and six test administrations.)

b. Basic Secondary Sample

Mean percentile ranks and grade equivalents for students in the Basic Secondary sample are shown in Table IV-6. (No grade-equivalent conversion tables were

TABLE IV-6. BASIC SECONDARY SAMPLE: PRETEST ACHIEVEMENT SCORES

Analysis Sample	Racial/ Ethnic Group	Total Reading						Total Math					
		Grade 10		Grade 11		Grade 12		Grade 10		Grade 11		Grade 12	
		Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.
Year One Cross-Sectional	Total	30	-	32	-	34	-	23	7.9	21	8.3	21	8.6
	Black	13	-	16	-	17	-	10	6.7	10	7.3	8	7.3
	Spanish	I.N.	-	I.N.	-	I.N.	-	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.
	White	51	-	52	-	55	-	42	9.5	40	10.1	36	10.2
Year Two Cross-Sectional	Total	27	-	32	-	33	-	28	8.3	28	8.9	28	9.2
	Black	13	-	13	-	14	-	13	6.7	12	7.1	12	7.5
	Spanish	25	-	21	-	40	-	28	8.3	19	8.1	28	9.1
	White	41	-	47	-	49	-	43	9.5	47	10.7	48	11.3
Year Three Cross-Sectional	Total	25	-	28	-	29	-	27	8.2	25	8.6	27	9.1
	Black	13	-	14	-	14	-	13	6.7	10	6.8	11	7.3
	Spanish	19	-	18	-	29	-	16	7.1	21	8.2	18	8.2
	White	35	-	40	-	41	-	39	9.2	41	10.0	44	10.7
Longitudinal	Total					23	-					23	8.8
	Black					13	-					12	7.5
	Spanish					33	-					11	7.3
	White					47	-					50	12.0

available at this level for the reading scales.) Pretest scores for Year Three were obtained from 2,286 students in the cross-sectional sample and 238 students in the longitudinal sample. As in the elementary sample, student need for remedial services was apparent: percentile ranks were consistently below the national average, with overall sample means for different subtests and grade levels running between the 25th and 30th percentiles. Again, pretest scores for minority-group students, who tended to have lower socioeconomic status, were consistently lower than those of non-minority students. Unlike the Basic Elementary sample, however, the secondary-level sample did not show a clear overall pattern of changes in pretest percentile ranks over successive evaluation years.

c. Pilot Elementary Sample

Pretest scores of students in the Pilot Elementary sample are summarized in Table IV-7. The Year Three scores are based upon data from 3,102 students in the cross-sectional sample and 475 students in the longitudinal sample. As with the Basic Elementary sample, data are shown separately for fourth-grade students receiving test Levels 2 and 3.

In comparing Year Three test results for the two elementary samples, Basic and Pilot, it is immediately evident that overall, the entry performance of students in the minority-isolated (Pilot) schools was lower than that of students in the desegregated (Basic) schools. As in Year Two, this pattern of difference was quite strong and consistent among both Spanish-background and White students. By contrast, there was no clear pattern of test score differences between Black students in the two types of school environment. As a consequence, the disparity in performance between Black and White students was considerably smaller in the Pilot Elementary sample than in the Basic Elementary sample.

In common with the Basic samples, the Pilot Elementary sample students had lower percentile ranks in math than in reading. Also similar to the pattern

TABLE IV-7. PILOT ELEMENTARY SAMPLE: PRETEST ACHIEVEMENT SCORES

Analysis Sample	Racial/ Ethnic Group	Total Reading								Total Math							
		Grade 3		Grade 4, Level 2		Grade 4, Level 3		Grade 5		Grade 3		Grade 4, Level 2		Grade 4, Level 3		Grade 5	
		Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.	Percentile	G.E.
Year One Cross-Sectional	Total	20	2.1			16	2.5	19	3.3	14	2.1			14	2.8	17	3.8
	Black	17	2.0			12	2.3	22	3.1	24	2.5			19	3.1	21	3.9
	Spanish	24	2.3			33	2.6	19	3.3	31	2.6			29	3.4	26	4.2
	White	37	2.7			28	3.1	36	4.4	37	2.8			34	3.5	39	4.6
Year Two Cross-Sectional	Total	25	2.3			16	2.5	17	3.1	13	2.0			16	2.9	13	3.5
	Black	25	2.3			16	2.5	14	3.0	15	2.1			16	2.9	13	3.5
	Spanish	24	2.3			16	2.5	15	3.1	15	2.1			18	3.0	14	3.5
	White	33	2.5			34	3.3	29	4.0	18	2.2			23	3.2	19	3.8
Year Three Cross-Sectional	Total	29	2.4	21	2.8	19	2.6	20	3.4	18	2.2	19	3.1	18	3.0	17	3.6
	Black	30	2.4	20	2.7	19	2.6	19	3.3	18	2.2	19	3.1	18	3.0	15	3.6
	Spanish	24	2.3	20	2.7	12	2.3	17	3.2	16	2.2	15	2.9	16	2.9	17	3.7
	White	37	2.7	24	2.9	26	3.1	33	4.2	23	2.4	21	3.1	21	3.2	24	4.1
Longitudinal	Total							24	3.7							19	3.8
	Black							22	3.6							18	3.8
	Spanish							24	3.7							21	3.9
	White							31	4.1							24	4.1

in the Basic Elementary sample, Pilot cross-sectional sample students tended to show higher percentile ranks in each successive evaluation year.

d. Initial Achievement Differences Related to Sex and Socioeconomic Status

Within each racial/ethnic group, mean standardized achievement scores were calculated for male and female students to determine possible interaction effects of sex with racial/ethnic group in relation to achievement. The achievement of each racial/ethnic group was also examined in relation to SES. Socioeconomic status was dichotomized into "high" and "low" categories on the basis of the "SES/luxury item" index described earlier in this chapter. The resulting statistics, presented in Appendices IV-A through IV-F, showed little or no evidence of interaction effects. As in Year Two, female students and students of higher SES level tended to have higher pretest scores regardless of race.

3. INITIAL STUDENT PERCEPTIONS OF SCHOOL CLIMATE

The School Climate Questionnaires (SCQs) were developed to measure perceived discrimination in the ESAA sample schools. School climate was considered potentially important both as a district/school contextual variable and as an outcome measure. At the elementary level, two multiple-item scales were developed: Teacher-Student Interaction, and Treatment by Principal. At the secondary level, six scales were developed: Teacher-Student Interaction, Treatment by Administrators 1 (principals and vice-principals), Treatment by Administrators 2 (counselors), Perceived School Discrimination, Student Intergroup Relations, and Index of Alienation.

The Teacher-Student Interaction (TSI) scales at both levels were designed to measure the students' perceptions of how well their teachers were treating them. The Treatment by Principal (TP) scale at the elementary level and the two Treatment by Administrator scales at the secondary level (AD1 and AD2) measured students' perceptions of how well they were being treated by these administrators. Perceived School discrimination (PSD) focused on whether the students thought their school was fair toward students of different racial/ethnic groups, and the Student Intergroup Relations (SIR) scale provided a measure of the degree to which students of various racial/ethnic groups interacted in school. The last scale, Index of Alienation (IAL), measured the students' reported feelings of alienation from the school and from their peers.

The range of possible scores for all scales was 0 to 100, with high scores indicating favorable attitudes about school climate. Because there were no national norms or natural anchor point for these scales, it was somewhat difficult to determine what score level would be considered high or low; for the same reason, it is not appropriate to compare scores across the different scales.

Unfortunately, the psychometric properties of the SCQ scales were rather poor. Inter-item correlations of the scales were low (from .08 to .34 at the elementary level, and from .18 to .60 at the secondary level), as was variability of the scores across administrations of the instrument and across schools. These weaknesses raise serious doubts about the usefulness of the scales as outcome measures, particularly since measures of change are always less reliable than the individual scores on which those change measures are based. Thus, in the remainder of this report, little emphasis is placed on SCQ change scores as dependent variables for either impact or relational analyses. However, some attention is given to the SCQ pretest scores in the present chapter, as those scores are based on single measures and may be helpful in comparing different subsamples.

Table IV-8 presents mean pretest scores on each SCQ subscale for Basic Elementary, Basic Secondary, and Pilot Elementary sample students in the Year Two, Year Three, and three-year longitudinal samples. For each sample, scores are shown separately for minority and non-minority students.

a. Basic Elementary Sample

The most notable characteristic of the data for all three evaluation samples was very limited variability in the mean values for each scale of the SCQ.

TABLE IV-8. MEAN PRETEST SCHOOL CLIMATE QUESTIONNAIRE SCALE SCORES

Evaluation Sample	SCQ Scale	Statistic	Year Two Cross-Sectional			Year Three Cross-Sectional			Longitudinal		
			Total	Minority	Non-Minority	Total	Minority	Non-Minority	Total	Minority	Non-Minority
Basic Elementary	TSI	$\overline{X}$	69.38	69.34	69.45	69.88	70.21	69.61	69.03	68.68	69.56
		S.D.	11.72	12.11	11.41	11.62	12.28	11.16	11.48	11.74	11.04
	TP	$\overline{X}$	84.45	82.41	86.60	85.57	81.68	88.38	82.32	78.61	88.04
		S.D.	17.87	19.04	16.30	17.82	19.48	15.71	19.56	20.61	16.29
Basic Secondary	TSI	$\overline{X}$	75.36	76.18	74.99	75.40	75.52	75.35	77.34	75.35	79.07
		S.D.	12.13	12.90	11.92	12.54	12.95	12.58	13.13	12.86	14.37
	AD1	$\overline{X}$	77.95	77.44	78.64	77.94	78.17	78.13	80.08	79.26	81.82
		S.D.	16.25	17.35	16.00	16.23	16.48	16.10	17.49	18.28	16.69
	AD2	$\overline{X}$	84.31	83.40	84.16	83.07	81.31	83.92	84.95	83.93	85.06
		S.D.	16.88	17.49	16.74	17.73	18.42	17.08	18.26	18.59	18.36
	PSD	$\overline{X}$	86.66	79.95	90.92	85.14	77.95	89.86	86.98	83.23	92.29
		S.D.	16.57	18.06	14.10	17.84	19.56	14.90	16.21	18.00	10.72
	SIR	$\overline{X}$	72.12	75.45	69.69	72.30	75.16	70.51	71.02	73.84	66.14
		S.D.	14.43	13.67	14.49	13.54	13.14	13.35	13.49	13.30	13.34
	IAL	$\overline{X}$	83.95	82.57	84.93	84.52	83.48	85.64	85.94	84.47	87.39
		S.D.	9.72	9.78	9.68	9.42	9.31	9.30	8.63	8.63	8.18
Pilot Elementary	TSI	$\overline{X}$	69.40	69.55	68.12	68.65	68.88	67.74	67.96	68.22	66.32
		S.D.	12.10	12.19	11.76	11.91	11.93	11.48	11.36	11.37	11.28
	TP	$\overline{X}$	81.46	81.20	86.74	81.32	80.76	85.84	79.78	78.82	85.81
		S.D.	18.79	18.93	16.88	18.96	19.04	17.06	19.47	19.27	19.76

That is, scores for each scale did not differ widely across evaluation years or across samples. Within the Basic Elementary sample, the most consistent trend was that the non-minority students' perceptions of their treatment by school principals were more positive than those of the minority students. In Year Three, for example, the non-minority students' mean score on the TP scale was 88.4, while that of minority students was only 82.7.

b. Basic Secondary Sample

In this sample, there were two fairly substantial and consistent differences between the perceptions of minority and non-minority students. The minority students perceived much more racial discrimination in the schools than did the non-minority students. (Note that a higher score on the PSD scale denotes less perceived discrimination.) On the other hand, the minority students' scores on the SIR scale were considerably higher than those of non-minority students, indicating that minority students perceived more extensive interactions among different racial/ethnic groups than did White students.

c. Pilot Elementary Sample

Scores on the TP scale tended to be lower for the Pilot sample than for the Basic Elementary sample. Although the differences were not large, they suggest that interactions between school administrators and students may have been more favorable in desegregated schools than in minority-isolated schools. As in the Basic Elementary sample, Pilot minority students had less favorable perceptions of their interactions with and treatment by school principals (TP scale) than did non-minority students.

C. TREATMENT-CONTROL COMPARISONS OF STUDENT AND FAMILY CHARACTERISTICS

Student and family characteristics data were aggregated to the school level in all treatment-control comparisons, as the treatment-control distinction was meaningful only at the school level. Paired t-tests were performed on the initial (Year Three pretest) achievement test levels, initial school climate measures, the two SES measures, parents' education and occupation, and percentages of Black students, White students, and female students. Results of the achievement comparisons are presented in Tables IV-9 through IV-11; tables of the other characteristics are shown in Appendices IV-G through IV-J.

1. BASIC ELEMENTARY SAMPLE

Table IV-9 compares the reading and math pretest performance of treatment and control schools for the Year Three cross-sectional sample and for the three-year longitudinal sample; scores are presented separately for fourth-grade students receiving Level 2 and those receiving Level 3 of the achievement tests. The Basic Elementary students showed a pattern of higher achievement pretest scores for control schools than for treatment schools; however, these differences were fairly small, and none were statistically significant.

2. BASIC SECONDARY SAMPLE

As Table IV-10 shows, Basic Secondary control schools in Year Three had higher reading and math pretest scores than did treatment schools. Only at grade 12, however, were these differences statistically significant.

3. PILOT ELEMENTARY SAMPLE

Table IV-11 presents Pilot treatment-control comparisons for achievement pretest scores. None of the treatment-control differences reached statistical significance. Unlike the Basic Elementary sample, the Pilot sample showed little evidence of consistent trends (regardless of significance level) that might suggest a systematic difference between the treatment and control groups.

4. SUMMARY OF TREATMENT-CONTROL COMPARISONS

For the Pilot Elementary sample, there was little evidence that student and family characteristics of the treatment schools differed systematically from those of the control schools. In both the Basic Elementary and Basic Secondary

TABLE IV-9. BASIC ELEMENTARY SAMPLE: TREATMENT-CONTROL COMPARISONS OF INITIAL (PRETEST) ACHIEVEMENT SCORES

Variable		Year Three Cross-Sectional								Longitudinal	
		Grade 3		Grade 4, Level 2		Grade 4, Level 3		Grade 5		Grade 5	
		Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Reading Pretest	Mean	48.13	51.92	57.94	62.02	27.72	29.82	35.18	37.44	35.82	38.12
(Total Raw Score)	S.D.	9.02	10.96	11.46	9.68	6.72	8.64	7.18	8.64	6.68	9.39
	N	20	20	20	20	20	20	19	19	17	17
Math Pretest	Mean	55.69	58.62	73.41	76.91	27.07	28.33	36.04	36.77	35.90	37.04
(Total Raw Score)	S.D.	6.69	10.44	9.08	9.72	5.50	6.50	5.93	6.83	6.09	7.63
	N	20	20	20	20	20	20	19	19	17	17

TABLE IV-10. BASIC SECONDARY SAMPLE: TREATMENT-CONTROL COMPARISONS OF INITIAL (PRETEST) ACHIEVEMENT SCORES

Variable		Year Three Cross-Sectional Sample						Longitudinal Sample	
		Grade 10		Grade 11		Grade 12		Grade 12	
		Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Reading Pretest (Total Raw Score)	Mean	41.89	43.07	48.30	50.55	49.52*	55.53	49.05	55.83
	S.D.	8.92	10.54	12.48	10.56	12.75	15.62	15.95	17.00
	N	12	12	12	12	11	11	6	6
Math Pretest (Total Raw Score)	Mean	39.27	40.13	44.14	45.71	42.87*	49.55	43.24	49.39
	S.D.	11.32	12.51	13.92	9.35	13.35	13.93	13.01	19.22
	N	12	12	12	12	11	11	6	6

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*Treatment-control difference is significant at the .05 probability level.

TABLE IV-11. PILOT ELEMENTARY SAMPLE: TREATMENT-CONTROL COMPARISONS OF INITIAL (PRETEST) ACHIEVEMENT SCORES

Variable		Year Three Cross-Sectional								Longitudinal	
		Grade 3		Grade 4, Level 2		Grade 4, Level 3		Grade 5		Grade 5	
		Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Reading Pretest	Mean	42.85	42.88	52.93	50.27	23.44	23.27	30.81	30.74	34.24	33.59
(Total Raw Score)	S.D.	8.66	8.24	9.42	9.04	3.95	3.46	6.90	6.13	5.44	4.42
	N	10	10	11	11	11	11	13	13	8	8
Math Pretest	Mean	53.76	52.54	72.00	72.92	24.09	23.28	33.52	33.69	36.24	25.32
(Total Raw Score)	S.D.	5.38	5.61	5.80	8.26	3.51	2.86	4.44	4.64	4.42	2.86
	N	10	10	11	11	11	11	13	13	8	8

samples, however, a few statistically significant differences suggested that the control schools may have had higher initial (pretest) achievement scores than those of the paired treatment schools. The number of statistically significant differences was fairly small in relation to the total number of treatment-control comparisons performed (2 out of 14 for the combined Basic samples). However, since the direction of differences, even where non-significant, was so consistent, these differences cannot be ignored. For this reason, in the analyses of ESAA program impact (see Chapter VI), comparisons of achievement gains for treatment and control schools are performed both with and without adjustments for differences in pretest scores.

D. SUMMARY OF RESULTS: STUDENT AND FAMILY CHARACTERISTICS

This chapter has described certain student and family background characteristics, pretest achievement scores, and school climate perceptions of students in the Basic Elementary, Basic Secondary, and Pilot Elementary samples at the beginning of the 1975-76 school year (the third year of ESAA program implementation). Highlights of the findings are summarized below.

- In the Basic samples, about three-fourths of the students' mothers and fathers were reported by the students' teachers to have completed high school, in contrast with about half the parents in the Pilot sample. The percentage of fathers holding jobs in the service or labor category (the lowest of three categories used) was around 49 percent for the Basic Elementary sample, 39 percent for the Basic Secondary sample, and 70 percent for the Pilot Elementary sample. Parents of Pilot students were also reported to have lower socioeconomic status than those of Basic students. Non-minority parents generally had more professional jobs, more education, and higher socioeconomic status than did minority parents.

- Slightly more than half the students in the Basic Elementary sample were White, another two-fifths were Black, and around six percent were Spanish-background. At the secondary level, Whites constituted about

58 percent of the Basic sample; Blacks, about 37 percent; and Spanish-background, almost 5 percent. As in previous years, the Pilot sample was most heavily minority-concentrated; more than half the sample students were Black, and more than a fourth were Spanish-background. In none of the three samples were there substantial percentages of other racial/ethnic groups, though the Pilot Elementary sample did contain almost four percent American Indians.

- An acute need for compensatory education services was again apparent among sample students in Year Three, as in previous evaluation years. Pretest mean achievement percentile ranks (for all racial/ethnic groups combined) ranged between the 17th and 38th percentiles. Percentile scores were generally higher in reading than in math, and were somewhat higher for non-minority than for minority students.
- Students in Pilot (i.e., minority-isolated) schools tended to have lower achievement scores than those in Basic (desegregated) schools, even allowing for differences in racial/ethnic composition of the two samples. As in Year Two, this pattern of differences in scores between Pilot and Basic schools was quite consistent among both Spanish-background and White students; by contrast, there was no clear pattern of test score differences between Black students in the two types of schools. It is unclear whether the overall achievement differences between Basic and Pilot schools are attributable in any causal fashion to differences in school environment, or whether they simply reflect the higher socioeconomic status of students enrolled in Basic schools.
- There was little evidence of interaction effects between the students' socioeconomic status or sex, and their race, with respect to achievement levels. Female students and higher-SES students tended to have higher pretest scores regardless of race.
- In both the Basic and Pilot Elementary samples, minority students tended to have less favorable perceptions of their interactions with

and treatment by school principals than did non-minority students. There also was some evidence that the students' perceived treatment by principals was more favorable in Basic (desegregated) schools than in Pilot (minority-isolated) schools. Although there was no direct evidence of causality, this latter finding, which occurred for both minority and non-minority students, does suggest a possible advantage for the desegregated environment.

- In Basic Secondary schools, minority students perceived much more racial discrimination in the schools than did non-minority students. On the other hand, minority students perceived more extensive interactions among different racial/ethnic groups than did White students.
- In the Pilot sample, there was no evidence of systematic differences between sample students in the treatment (ESAA-funded) and control (non-ESAA-funded) schools, with respect to the initial (pretest) scores on achievement tests, or with respect to other student and family characteristics. However, in the Basic Elementary and Secondary samples, the control schools tended to have higher pretest scores than those of the treatment schools. There are several possible explanations for this apparent difference, including differential attrition rates that might have introduced sample bias. Although most of the treatment-control differences were not statistically significant, the consistency of direction of the differences seems to indicate more than chance variations. Further, the direction of differences suggests that subsequent treatment-control comparisons of gains in test scores might tend to underestimate the relative achievement of the treatment group. For this reason, in the analyses of ESAA program impact (discussed in Chapter VI), treatment-control comparisons are performed both with and without adjustments for differences in pretest scores.

(Last page this chapter)

CHAPTER V

PROGRAM CHARACTERISTICS OF SAMPLE SCHOOLS

This chapter describes school expenditure patterns, resource availability and allocations, student exposure to various educational activities, and other selected characteristics of programs in the sample ESAA districts. Improved calculation procedures, used for the first time in Year Three, show a much greater funding advantage for Basic Elementary treatment schools over control schools than that reported in previous years. (Most of this increase in treatment-control difference resulted from the change to more accurate calculation methods, but there was apparently some real increase between Years Two and Three.) Specifically, a statistically significant difference of almost $400 in total per-pupil expenditures was found in Year Three, favoring the treatment schools. Differences generally favoring treatment schools were also found in the Year Three Pilot Elementary and Basic Secondary samples, but those differences were not statistically significant. Both Basic samples (elementary and secondary) showed significantly greater allocations of their funds for basic skills in the treatment schools than in control schools; no such difference was found in the Pilot sample.

Comparisons were made between treatment and control schools, and among samples, with respect to program resources and services, and allocations of those resources and services to the different areas of educational activity. Overall, few statistically significant treatment-control differences were found in academic, intercultural, or desegregation activities related to ESAA objectives; most of those found were in Basic Elementary schools. For example, in the Basic Elementary sample, treatment schools tended to have smaller classes and generally greater resource allocation for remedial specialists and instructional aides than did the control schools. More teachers perceived that most decisions were being made at the administrative level in treatment schools than in control schools.

Classes in Basic Elementary schools tended to have smaller numbers of students than did those in Pilot schools. In the Basic Elementary sample, treatment schools had smaller classes on the average than did control schools, whereas the reverse relationship was found in the Pilot Elementary sample.

This chapter presents data on the program characteristics of the sample schools. Such characteristics are of interest for at least three reasons. First, local program coordinators may wish to compare their own programs with those of the sample schools; regional and national officials may also wish to examine the summary data, as no other such data have been compiled for any national sample of ESAA-participating districts. Second, comparisons of program characteristics in treatment and control schools are extremely important for assessing the validity of the study's impact design. That design assumed that treatment schools would differ substantially from control schools in their total per-pupil funding, because of the expenditure of ESAA monies in treatment schools. Further, the design assumed that these funding differences would lead to treatment-control differences in resources committed and in services available to the sample students. Third, some of the program variables discussed in this section are analyzed in Chapter VII, to determine what program traits or approaches might be associated with greater student achievement gains.

Section A of this chapter is concerned with the magnitudes, sources, and allocations of funds in the sample schools. It compares regular, supplemental (including ESAA), and total per-pupil expenditures for the three different evaluation samples, and for treatment and control schools. It also compares the allocations of those funds for different areas of activity (e.g., reading and math instruction, curriculum development, and cultural enrichment), and presents data relating school expenditures to academic needs.

Section B examines the program resources and services paid for by those school expenditures, and the allocations of those resources and services to the different areas of educational activity. Data are presented on such program characteristics as special training for teachers, personnel time in instructional activities, personnel and community involvement in the planning and evaluations of compensatory programs, student exposure to different types of instruction and to intercultural activities, class size, and district and school activities to support desegregation. Again, comparisons are drawn among the three evaluation samples, and between treatment and control schools.

A. EXPENDITURES

As in the preceding two years, data were collected in Year Three from sample schools regarding their levels and allocations of expenditures. This information provided not only an overview of the fiscal resources available to the schools for their educational programs, but also a possible basis for assessing the districts' and schools' emphasis on different areas of educational activity. In Chapter VII (Relational Analyses), fiscal allocation data are further analyzed in conjunction with student achievement gains, to determine whether there were systematic relationships between expenditure levels and program effects.

This section reviews the methodology of the fiscal analyses, and summarizes results for each sample. Expenditure levels and allocation patterns are described and compared for the paired treatment and control schools in each sample. In addition, consideration is given to the relationship of these funding variables to the level of student need, as measured by pretest scores on standardized achievement tests.

The discussion focuses on school-level data, rather than on district-level data, which include schools not participating in the study. Comparison of funding between the treatment and control schools is emphasized, because a major evaluation issue is the total funding difference between ESAA-funded (treatment) and non-ESAA funded (control) schools.

1. METHODOLOGY

a. Data Collection

The primary source of information on expenditures was a questionnaire completed and returned by school district business managers. This questionnaire provided information on the amount of regular district expenditure; amounts and sources of district supplemental funding; district average daily attendance (ADA); school enrollment; amounts and sources of school supplemental funding; and allocation of supplemental funds to ten areas appropriate for the expenditure of ESAA funds (as defined by ESAA guidelines). Follow-up telephone calls made it possible to obtain complete or partial fiscal information for 98 of the 102 schools (96 percent).

The following definitions were used for the funding analysis:

- Regular Expenditures--A school makes these expenditures to its regular school program, normally supported by state and/or local funds.
- Supplemental Expenditures--A school makes these expenditures to supply remedial or compensatory services to low-achieving or disadvantaged children. These costs are over and above regular expenditures and are financed primarily by state or federal funds, including ESAA.
- Total Expenditures--Total expenditures are the sum of regular and supplemental expenditures.

b. Computation of Per-Pupil Expenditures

Per-pupil expenditures were used in all analyses, to ensure comparability across schools. For the present report, per-pupil figures were calculated by methods somewhat different from those used in Years One and Two. The revised procedures, which are believed to provide more realistic and accurate estimates of the expenditures applicable to the particular samples of students participating in this study, revealed Year Three expenditure patterns that differed substantially in certain respects from those found in Years One and Two. For this reason, it is important to contrast in some detail the old and new formulas applied in calculating per-pupil expenditures. The following paragraphs describe both past and present calculation procedures for regular, supplemental, and total per-pupil expenditures.

(1) Regular Per-Pupil Expenditures

In Years One and Two, this information was derived from the questionnaire completed by district business managers. Total district regular expenditures were divided by total district enrollments to obtain per-pupil figures. In those two years, the evaluation assumed that all schools within a district would have the same per-pupil level of regular district support; such equality of support is, in fact, required under law in some states. However, the validity of this assumption was brought into question by informal data provided by some business managers. Thus, in Year Three, data on regular per-pupil expenditures were collected separately for each sample school. Overall, the revised procedure did not show widespread intradistrict variations, but in a few districts the treatment and control schools were found to differ slightly in regular per-pupil expenditures.

(2) Supplemental Per-Pupil Expenditures

Ideally, one would wish to know the actual supplemental expenditures for each student in the treatment and control samples, so that supplemental expenditure levels could be compared for the treatment and control groups and could be related to the students' performance on the outcome measures. Unfortunately, it is almost never possible to obtain meaningful cost data at the individual student level, and this evaluation was no exception. Expenditure data collected in this study were, for the most part, total figures for entire schools. To be sure, information was available on the number of students in each school who were receiving support under each type of supplemental program. The total school dollars for each supplemental program could, therefore, be divided by the number of participating students to obtain per-pupil expenditure figures for that particular program. However, nothing was known in Years One and Two about the amount of overlap within a school among the subsets of students receiving support from ESAA, from ESEA Title I programs, and from other special programs supported at the state or district level. Thus, it was impossible to determine the actual total supplemental expenditures for any specified subset of students (e.g., ESAA-participating students) in the school. Because it did not seem reasonable to assume that ESAA students were necessarily participating in other special programs, and because per-pupil figures were desired that would have some comparability across districts, in Years One and Two each school's total supplemental funds from all sources were calculated and divided by the total school enrollment. The resulting figure was broadly representative of the entire school, but was not necessarily representative of the sample students.

In an effort to improve the accuracy of estimates of total supplemental per-pupil expenditures, items were added to the Year Three questionnaires, to determine the percentage of ESAA-participating students (or of ESAA-eligible students, in the case of control schools) receiving funds from each non-ESAA compensatory program category. This information, combined with data on the number of participants in each compensatory program in each school, made it possible to estimate the overlap among students participating in programs supported by different funding sources, including ESAA. The overlap figures, in turn, permitted the calculation of total per-pupil supplemental expenditures based only on the school's ESAA-participating or eligible students.

Detailing the calculation procedures may help to clarify the new approach. Assume, for simplicity, that a school had only two compensatory programs, ESAA and Title I. Assume also that this hypothetical school had 100 ESAA participants, and that 45 percent of those students were reported to be receiving Title I support as well. Finally, assume that the school had a total of 600 Title I participants, and that the total funding levels for ESAA and Title I were $20,000 and $100,000, respectively. The first step was to calculate the average per-pupil ESAA expenditure level for ESAA participants, i.e., $\frac{\$20,000}{100} = \$200$. Next, the per-pupil Title I expenditure, averaged across all

ESAA participants, was calculated by first determining the average Title I per-pupil expenditure for all Title I participants ($\frac{\$100,000}{600} \approx \$167$), and then multiplying the resulting figure by the percentage of ESAA participants also participating in Title I ($167 x 45% ≈ $75). Finally, the estimates of average per-pupil ESAA and Title I expenditures for ESAA participants were added together, to obtain total supplemental per-pupil expenditures for the ESAA participants ($200 + $75 = $275).

Of course, the Year Three calculation procedures still required certain assumptions about the distribution of expenditures, and these assumptions could not be tested definitively within the constraints of this study. For example, the method had to assume that compensatory funds were distributed evenly across grade levels within a school, since no data were available specifically for grades 3 through 5, or 10 through 12. In actuality, results of other studies suggest that elementary schools tend to concentrate compensatory funds more heavily in the primary grades. It should be noted, however, that moderate inaccuracies in assumptions of this type, while perhaps artificially inflating or depressing the absolute dollar values presented here, should have relatively little impact on comparisons of expenditure levels for different evaluation samples, or for treatment-control comparisons, which are of prime importance in this chapter.

All in all, the new methods used to calculate per-pupil supplemental expenditures for Year Three seem much more realistic than those employed in preceding years. The crucial point is that in Year Three, for the first time, estimates of total per-pupil supplemental expenditures were based only on the school's populations of ESAA-participating or eligible students. Since the sample students were selected randomly from those populations, the new estimates should provide a much clearer picture than before of expenditures for those students who produced the outcome data and who constituted the samples of interest in this evaluation.

(3) Total Per-Pupil Expenditures

Total per-pupil expenditures were obtained in all three years by summing the regular and supplemental per-pupil expenditures. This sum produced a total per-pupil expenditure for ESAA-participating or -eligible students in the paired treatment and control schools.

c. Standardization of Expenditure Data

In any examination of fiscal information, it is important to adjust for local and regional differences in cost of living, so as to maximize comparability of data across sample schools. In the previous two years, this standardization was accomplished by dividing actual expenditures in each district by a cost-of-living index for that district. This index was based upon a single variable: beginning teachers' salaries. Specifically, the index for a given district was equal to that district's salary for a beginning teacher, divided by the average beginning teacher's salary across all districts in the study. Thus, the _standardized_ expenditure figures for a district with unusually high salaries would be lower than the _actual_ reported expenditures for that district, to reflect the lower purchasing power of dollars in that district.

For Year Three analyses, the cost-of-living index was based on several different teacher salary measures, rather than on a single measure. Six different categories of teachers were defined, and an index was calculated for each category in each district, using the same procedure described above. The six categories represented the combinations of two education levels (bachelor's degree and master's degree), and three experience levels (beginning teacher, teacher with one year's experience, and teacher with five years' experience). For each sample district, the six indices were then averaged to combine them into a single, overall salary cost index for that district. As with the simpler index used in Years One and Two, the composite index derived for each district in Year Three was divided into actual expenditure figures for that district to produce standardized expenditures.

The indices calculated for Year Three ranged in value from .80 to 1.24, indicating substantial variation in average teacher salaries among the sample schools. Adjustments based upon these indices should, therefore, have helped to reduce spurious variance arising from cost-of-living influences. All analyses reported in this section of Chapter V use standardized per-pupil expenditures.

2. RESULTS

This section presents the results of analyses conducted on the paired treatment-control schools. The analyses describe (1) the per-pupil levels of ESAA supplemental, non-ESAA supplemental, total supplemental, regular, and total expenditures; (2) the allocation pattern of the supplemental funds; and (3) the extent to which variations in school expenditure levels were associated with variations in student needs (as defined by pretest performance on standardized achievement tests and on the School Climate Questionnaire). Separate results are presented for the treatment and control schools within each of the three evaluation samples (Basic Elementary, Basic Secondary, and Pilot Elementary). In all cases, the reported figures are standardized per-pupil expenditures for ESAA-participating (or ESAA-eligible) students.

a. Levels of ESAA Supplemental, Non-ESAA Supplemental, Regular, and Total Expenditures

(1) ESAA Supplemental Expenditures

ESAA supplemental funding was a critical program variable for the evaluation, as the presence or absence of ESAA funds defined the two experimental conditions. The ESAA per-pupil figures reported in this section were calculated by dividing a school's total ESAA funds by the number of students participating in the ESAA program.

Tables V-1 through V-3 display the frequency distribution and mean level of per-pupil ESAA funding for each sample. As these tables show, substantial ESAA funds were found in some control schools, particularly in the Pilot Elementary and Basic Secondary samples. One reason for this apparent anomaly is that in certain cases, control schools were allowed to have ESAA programs in grades other than those involved in this study, e.g., grade 6. Such arrangements were made in two Basic Elementary and two Pilot Elementary control schools. Because all funding estimates were made at the school level, not at the grade level, ESAA funds used in this manner were included in per-pupil calculations.

In other instances, control schools used ESAA funds for non-sample students in one or more of the evaluation grades. This was apparently the case in four Basic Secondary and four Pilot Elementary control schools. A few of these special arrangements were made by prior agreement with USOE/SDC (in an effort to maintain longitudinal sample size), but others were established unilaterally by the districts.

In the Basic Elementary sample (see Table V-1), the degree of "leakage" of ESAA funds to control schools was minimal, especially since most of these funds were spent at grade levels not included in the evaluation. In the Basic Secondary and Pilot Elementary samples, however, a potentially serious weakening of the treatment-control distinction is evident (see Tables V-2 and V-3). For the Pilot sample, the average per-student ESAA expenditure in control schools was roughly half that in the paired treatment schools; for the Basic Secondary sample, the control school per-student expenditures were over a third as large as those in the treatment schools. In theory, none of the control schools' ESAA funds would have benefited the sample students directly. It seems unrealistic, however, that the sizable infusion of ESAA funds into some Pilot and Basic Secondary control schools would have had no effect on the sample students. If nothing else, the ESAA funds might have freed non-ESAA supplemental funds to benefit the sample students. Thus, this finding

TABLE V-1. BASIC ELEMENTARY SAMPLE: ESAA PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional and Longitudinal*			
	Treatment		Control	
	Frequency	Percentage	Frequency	Percentage
$0-50	3	14.3	18	85.7
$51-100	5	23.8	1	4.8
$101-150	2	9.5	0	0.0
$151-200	4	19.0	0	0.0
$201-250	0	0.0	0	0.0
$251-300	0	0.0	1	4.8
$301-400	3	14.3	1	4.8
$401-500	0	0.0	0	0.0
$500+	4	19.0	0	0.0
TOTAL N	21		21	
$\bar{X}$	320.84		33.96	
S.D.	458.99		87.43	

*Basic Elementary cross-sectional and longitudinal samples were identical.

TABLE V-2. BASIC SECONDARY SAMPLE: ESAA PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional				Longitudinal			
	Treatment		Control		Treatment		Control	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$0-10	3	20.0	9	60.0	2	25.0	6	75.0
$11-30	3	20.0	1	6.7	2	25.0	0	0.0
$31-50	1	6.7	1	6.7	0	0.0	0	0.0
$51-70	2	13.3	0	0.0	2	25.0	0	0.0
$71-100	1	6.7	1	6.7	1	12.5	1	12.5
$101-120	2	13.3	2	13.3	1	12.5	1	12.5
$121-150	1	6.7	1	6.7	0	0.0	0	0.0
$151-180	1	6.7	0	0.0	0	0.0	0	0.0
$181-200	0	0.0	0	0.0	0	0.0	0	0.0
$200+	1	6.7	0	0.0	0	0.0	0	0.0
TOTAL N	15		15		8		8	
$\bar{X}$	91.00		32.03		46.18		23.46	
S.D.	129.56		50.17		38.71		43.73	

TABLE V-3. PILOT ELEMENTARY SAMPLE: ESAA PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional				Longitudinal			
	Treatment		Control		Treatment		Control	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$0-50	1	7.7	7	53.8	0	0.0	5	55.6
$51-100	1	7.7	0	0.0	1	11.1	0	0.0
$101-150	1	7.7	1	7.7	1	11.1	1	11.1
$151-200	0	0.0	1	7.7	0	0.0	1	11.1
$201-250	2	15.4	1	7.7	2	22.2	1	11.1
$251-300	3	23.1	0	0.0	2	22.2	0	0.0
$301-400	0	0.0	1	7.7	0	0.0	0	0.0
$401-500	2	15.4	0	0.0	1	11.1	0	0.0
$500+	3	23.1	2	15.4	2	22.2	1	11.1
TOTAL N	13		13		9		9	
$\bar{X}$	328.81		168.38		320.33		116.52	
S.D.	225.37		245.09		203.74		170.80	

creates serious doubt as to whether significant treatment-control differences in outcome should be expected for the Pilot Elementary and Basic Secondary samples. This issue is discussed further in subsequent sections of this chapter, and in the presentation of program impact data in Chapter VI.

In the following paragraphs, ESAA funding data are discussed for Year Three cross-sectional and longitudinal schools in the Basic Elementary, Basic Secondary, and Pilot Elementary samples.

(a) Basic Elementary Sample. ESAA per-pupil expenditures in treatment schools averaged around $321 (see Table V-1). The control schools, as expected, had a much lower level of ESAA funds, with an average of about $34 per pupil. Per-pupil figures varied considerably across schools, in both treatment and control groups. Separate results are not shown for the longitudinal sample, as that sample was identical (for Basic Elementary schools) to the Year Three cross-sectional sample.

(b) Basic Secondary Sample. Per-pupil ESAA funding in Basic Secondary schools was considerably lower than in Basic Elementary schools (see Tables V-1 and V-2). The mean ESAA per-pupil expenditure in Year Three cross-sectional treatment schools was $91. Longitudinal figures were somewhat lower, suggesting that schools added in Year Two may have received more funds and/or concentrated their funds on smaller numbers of students than did the schools continuing from Year One. In both the cross-sectional and longitudinal samples, control-school ESAA funds averaged one-third to one-half the level of treatment-school ESAA funds.

(c) Pilot Elementary Sample. In Pilot Elementary treatment schools (see Table V-3), ESAA per-pupil expenditures were higher than those in either of the Basic samples. The average Pilot treatment-school expenditure in the Year Three cross-sectional sample was almost $329 per pupil, while the control-school expenditure was about $168 per pupil. As in the Basic Secondary sample, longitudinal figures were somewhat lower for both sets of schools; however, the difference is more apparent for the control schools than for the treatment schools.

(2) Non-ESAA and Total Supplemental Expenditures

Non-ESAA supplemental expenditures included funds from ESEA Title I, ESEA Title III, ESEA Title IV, special state funds, and district compensatory funds. To calculate a school's non-ESAA supplemental per-pupil expenditures, per-pupil expenditures from all such supplemental sources were first weighted by the percentage of ESAA-participating or -eligible students receiving support from each source, and then were added together. The total per-pupil supplemental expenditure was the sum of the non-ESAA and ESAA supplemental expenditures. As a result, expenditure figures reported in Tables V-4 through V-9 can be compared directly with those contained in Tables V-1 through V-3, as all are based on funds directed to ESAA-participating or eligible students. Data are presented separately for treatment and control schools.

It should be noted that ESAA funds in control schools were included in the total supplemental figures for those schools. This approach reflects our belief that even though the ESAA funds in control schools were ostensibly directed to students other than those in the evaluation sample, these funds nonetheless would have increased the services available to the sample students.

(a) Basic Elementary Sample. As shown in Table V-4, non-ESAA supplemental expenditures in treatment schools averaged $196 per pupil. The control schools spent an average of $95 in non-ESAA supplemental funds per ESAA-eligible pupil. Total supplemental expenditures (see Table V-5) were almost $517 per pupil in treatment schools and only $129 in control schools. The treatment-control difference in total supplemental funds is, of course, due primarily to the higher level of ESAA funding in the treatment schools. These results are indicative of two important points. First, there is no evidence that control

TABLE V-4. BASIC ELEMENTARY SAMPLE: NON-ESAA SUPPLEMENTAL PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional and Longitudinal*			
	Treatment		Control	
	Frequency	Percentage	Frequency	Percentage
$0-50	11	55.0	16	76.2
$51-100	2	10.0	0	0.0
$101-150	3	10.0	0	0.0
$151-200	0	0.0	1	4.8
$201-300	1	5.0	2	9.5
$301-400	1	5.0	0	0.0
$401-500	0	0.0	0	0.0
$500+	3	15.0	2	9.5
TOTAL N	21		21	
$\bar{X}$	195.78		95.30	
S.D.	353.31		201.99	

*Basic Elementary cross-sectional and longitudinal samples were identical.

TABLE V-5. BASIC ELEMENTARY SAMPLE: TOTAL SUPPLEMENTAL PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional and Longitudinal*			
	Treatment		Control	
	Frequency	Percentage	Frequency	Percentage
$0-100	2	9.5	15	71.4
$101-200	7	33.3	1	4.8
$201-300	1	4.8	2	9.5
$301-400	4	19.0	1	4.8
$401-500	1	4.8	0	0.0
$501-600	0	0.0	0	0.0
$601-800	3	14.3	1	4.8
$801-1000	0	0.0	1	4.8
$1001-1200	1	4.8	0	0.0
$1200+	2	9.5	0	0.0
TOTAL N	21		21	
$\bar{X}$	516.62		129.26	
S.D.	711.62		256.44	

*Basic Elementary cross-sectional and longitudinal samples were identical.

schools received more non-ESAA funds to "compensate" for the lack of ESAA funds; the reverse was true, in fact. Second, the magnitude of the treatment-control difference in supplemental funds suggests that the treatment students received substantially more services than did the control students. Evidence relevant to this finding is presented in later parts of this report.

(b) *Basic Secondary Sample*. As shown in Table V-6, treatment schools in the Year Three Basic Secondary cross-sectional sample received only about $3 per pupil in supplemental funds from non-ESAA sources, and control schools in the same sample received only $1 per pupil. This $2 difference, added to the difference in ESAA expenditures, produced an average treatment-control difference of $60 in total supplemental expenditures (see Table V-7). Overall, supplemental funding results for this sample were characterized by low levels of expenditures--about a fifth the size of Basic Elementary expenditures--and little variability around the averaged values. Average per-pupil expenditures, both non-ESAA and total supplemental, were lower on the average in the longitudinal sample than in the cross-sectional sample. This would seem to indicate that schools in the sample from Year One received less supplemental money per ESAA student than did the schools selected in Year Two.

(c) *Pilot Elementary Sample*. Tables V-8 and V-9 show the supplemental expenditure data for paired treatment and control schools in the Pilot Elementary sample. The non-ESAA expenditure pattern was the reverse of that in the Basic Elementary sample. In the Pilot sample, the control schools received more non-ESAA supplemental money than did the treatment schools. However, the level of *total* supplemental funding was still higher in the treatment schools than in the control schools, because of difference in ESAA funding for the two groups.

The average per-pupil figures were higher for the longitudinal sample than for the Year Three cross-sectional sample, in both total supplemental and non-ESAA supplemental expenditures. This difference suggests that schools continuing

TABLE V-6. BASIC SECONDARY SAMPLE: NON-ESAA SUPPLEMENTAL PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional				Longitudinal			
	Treatment		Control		Treatment		Control	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$0	11	73.3	13	86.7	7	87.5	7	87.5
$1-10	1	6.7	1	6.7	1	12.5	1	12.5
$10+	3	20.0	1	6.7	0	0.0	0	0.0
TOTAL N	15		15		8		8	
$\bar{X}$	3.09		1.22		0.67		0.67	
S.D.	5.65		3.52		1.88		1.88	

TABLE V-7. BASIC SECONDARY SAMPLE: TOTAL SUPPLEMENTAL PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional				Longitudinal			
	Treatment		Control		Treatment		Control	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$0-10	2	13.3	9	60.0	2	25.0	6	75.0
$11-30	4	26.6	1	6.7	2	25.0	0	0.0
$31-50	1	6.7	1	6.7	0	0.0	0	0.0
$51-70	1	6.7	0	0.0	2	25.0	1	12.5
$71-100	2	13.3	1	6.7	1	12.5	0	0.0
$101-120	2	13.3	2	13.3	1	12.5	1	12.5
$121-150	1	6.7	1	6.7	0	0.0	0	0.0
$151-180	1	6.7	0	0.0	0	0.0	0	0.0
$181-200	0	0.0	0	0.0	0	0.0	0	0.0
$200+	1	6.7	0	0.0	0	0.0	0	0.0
TOTAL N	15		15		8		8	
$\bar{X}$	94.09		33.24		46.85		24.12	
S.D.	127.98		50.29		39.50		44.82	

TABLE V-8. PILOT ELEMENTARY SAMPLE: NON-ESAA SUPPLEMENTAL PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional				Longitudinal			
	Treatment		Control		Treatment		Control	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$0-50	6	48.2	8	61.5	3	33.3	4	44.4
$51-100	1	7.7	0	0.0	1	11.1	0	0.0
$101-150	0	0.0	0	0.0	3	33.3	0	0.0
$151-200	5	38.5	1	7.7	1	11.1	1	11.1
$201-300	0	0.0	1	7.7	0	0.0	1	11.1
$301-400	1	7.7	2	15.4	1	11.1	2	22.2
$401-500	0	0.0	1	7.7	0	0.0	1	11.1
$500+	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL N	13		13		9		9	
$\bar{X}$	90.51		129.60		109.03		185.31	
S.D.	107.13		181.95		111.28		195.65	

TABLE V-9. PILOT ELEMENTARY SAMPLE: TOTAL SUPPLEMENTAL PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional				Longitudinal			
	Treatment		Control		Treatment		Control	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$0-100	1	7.7	5	38.5	0	0.0	3	33.3
$101-200	1	7.7	0	0.0	1	11.1	0	0.0
$201-300	4	30.8	0	0.0	3	33.3	2	22.2
$301-400	0	0.0	3	23.1	0	0.0	2	22.2
$401-500	2	15.4	2	15.4	1	11.1	2	22.2
$501-600	3	23.1	2	15.4	3	33.3	2	22.2
$601-800	0	0.0	1	7.7	0	0.0	0	0.0
$801-1000	2	15.4	0	0.0	1	11.1	0	0.0
$1001-1200	0	0.0	0	0.0	1	0.0	0	0.0
$1200+	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL N	13		13		9		9	
$\bar{X}$	419.30		297.97		429.37		301.83	
S.D.	258.61		269.46		208.34		235.90	

from Year One were funded at higher levels in Year Three than were schools added to the sample in Year Two.

(3) Regular and Total Per-Pupil Expenditures

The regular per-pupil expenditure represents the amount of money contributed by the district and spent on non-compensatory services for each student. In Years One and Two, this figure was calculated by dividing the total regular district expenditures by the district ADA, and was assumed to be the same for all schools within a district. This year, each school's regular per-pupil expenditure was obtained directly from the district business manager's questionnaire, so that treatment and control figures could be calculated and reported separately.

The total per-pupil expenditure is the sum of the school's regular per-pupil expenditure and total supplemental per-pupil expenditure. (ESAA funds were included in the totals for control schools as well as for treatment schools.) This figure represents the total amount of money spent by the school for the average ESAA-participating or -eligible student.

(a) Basic Elementary Sample. Regular and total per-pupil expenditures for the Basic Elementary schools are presented in Tables V-10 and V-11. The treatment and control schools were almost identical in average level of regular expenditures (see Table V-10). However, the treatment-control difference in average total expenditure was almost $400 (see Table V-11), because of large ESAA and other supplemental funding differences (see Tables V-1 and V-4). On the average, the regular expenditures accounted for almost two-thirds of the total per-pupil expenditures in treatment schools and almost 90 percent in control schools.

The treatment-control difference in total per-pupil expenditures for Year Three ($380) is dramatically larger than that reported in Year One ($43) or

TABLE V-10. BASIC ELEMENTARY SAMPLE: REGULAR PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional and Longitudinal*			
	Treatment		Control	
	Frequency	Percentage	Frequency	Percentage
$0-500	0	0.0	0	0.0
$501-600	0	0.0	0	0.0
$601-700	2	9.5	2	9.5
$701-800	3	14.3	3	14.3
$801-900	1	4.8	1	4.8
$901-1000	6	28.6	6	28.6
$1001-1100	2	9.5	1	4.8
$1101-1200	2	9.5	3	14.3
$1201-1400	4	19.0	4	19.0
$1401-1600	0	0.0	0	0.0
$1600+	1	4.8	1	4.8
TOTAL	21		21	
$\bar{X}$	1032.12		1039.89	
S.D.	276.09		272.81	

*Basic Elementary cross-sectional and longitudinal samples were identical.

TABLE V-11. BASIC ELEMENTARY SAMPLE: TOTAL PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional and Longitudinal*			
	Treatment		Control	
	Frequency	Percentage	Frequency	Percentage
$0-800	1	0.0	3	14.3
$801-1000	2	9.5	9	42.9
$1001-1100	3	14.3	1	4.8
$1101-1200	2	9.5	2	9.5
$1201-1300	4	19.0	0	0.0
$1301-1400	1	4.8	2	0.0
$1401-1500	1	4.8	2	9.5
$1501-1700	3	14.3	2	9.5
$1701-1900	1	4.8	0	0.0
$1901-2100	1	4.8	1	4.8
$2101-2300	0	0.0	0	0.0
$2300+	3	14.3	1	4.8
TOTAL	21		21	
$\bar{X}$	1548.73		1169.15	
S.D.	755.57		482.65	

*Basic Elementary cross-sectional and longitudinal samples were identical.

in Year Two ($53). It must be kept in mind, however, that improved methods were used to calculate the per-pupil expenditures in Year Three. Thus, a logical question is, to what extent was the apparent change in treatment-control funding difference an artifact of the Year Three revision in computational procedures? To address this question, Year Three expenditure analyses were rerun with the calculation methods of Years One and Two. (The necessary data were not available for using Year Three calculation procedures on Year One and Year Two data, as would have been preferable.) These reanalyses are discussed in some detail in Chapter VI, Section E, in an attempt to explain impact findings for the Basic Elementary sample in Year Three. Briefly, the results of the reanalyses indicate that most, but not all, of the Year Three increase in treatment-control funding difference was probably caused by the change in calculation procedures. When the old procedure is used, the treatment-control difference for Year Three shrinks from $380 to about $80. This is still a larger difference, however, than that for either of the preceding years. Thus, it appears that funding differences in favor of the treatment schools did increase between Years Two and Three.

(b) Basic Secondary Sample. The difference between regular and total per-pupil expenditures in Basic Secondary schools was very small, as shown in Tables V-12 and V-13. Supplemental expenditures accounted for less than ten percent of the total per-pupil expenditures in treatment schools, and less than five percent in control schools. Also noteworthy is the relatively small treatment-control difference in total per-pupil expenditure; the average difference was less than $100 per pupil, or about eight percent of the total expenditure in either group of schools.

Common experience indicates that high schools usually have higher per-pupil expenditures than do elementary schools. Therefore, it may seem surprising that the data presented here for the Year Three sample, like those found in Years One and Two, show lower average expenditures in the secondary schools.

TABLE V-12. BASIC SECONDARY SAMPLE: REGULAR PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional				Longitudinal			
	Treatment		Control		Treatment		Control	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$0-500	0	0.0	1	6.7	0	0.0	0	0.0
$501-600	1	6.7	0	0.0	0	0.0	0	0.0
$601-700	0	0.0	0	0.0	0	0.0	0	0.0
$701-800	4	26.6	5	33.3	2	25.0	3	37.5
$801-900	1	6.7	0	0.0	1	12.5	0	0.0
$901-1000	0	0.0	0	0.0	0	0.0	0	0.0
$1001-1100	2	13.3	1	6.7	2	25.0	1	12.5
$1101-1200	4	26.6	6	40.0	2	25.0	4	50.0
$1201-1400	1	6.7	0	0.0	1	12.5	0	0.0
$1401-1600	2	13.3	2	13.3	0	0.0	0	0.0
$1600+	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL N	15		15		8		8	
$\bar{X}$	1021.53		992.02		992.63		965.61	
S.D.	311.34		341.06		214.08		209.37	

TABLE V-13. BASIC SECONDARY SAMPLE: TOTAL PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional				Longitudinal			
	Treatment		Control		Treatment		Control	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$0-800	1	6.7	2	13.3	0	0.0	1	12.5
$801-1000	5	33.3	4	26.6	3	37.5	2	25.0
$1001-1100	2	13.3	1	6.7	2	25.0	1	12.5
$1101-1200	1	6.7	6	40.0	0	0.0	4	50.0
$1201-1300	2	13.3	0	0.0	2	25.0	0	0.0
$1301-1400	1	6.7	0	0.0	1	12.5	0	0.0
$1401-1500	0	0.0	0	0.0	0	0.0	0	0.0
$1501-1700	3	20.0	2	13.3	0	0.0	0	0.0
$1701-1900	0	0.0	0	0.0	0	0.0	0	0.0
$1901-2100	0	0.0	0	0.0	0	0.0	0	0.0
$2101-2300	0	0.0	0	0.0	0	0.0	0	0.0
$2300+	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL N	15		15		8		8	
$\bar{X}$	1115.61		1025.26		1039.47		989.73	
S.D.	313.81		323.41		205.15		178.85	

The reason for this finding is not obvious, but one possible explanation is that many districts in the Basic Secondary sample were in inner cities of large metropolitan areas. (This urban concentration was a natural consequence of the sampling strategy, which required sample districts to have at least two "matched" secondary schools designated for ESAA participation; such a requirement tends to rule out smaller communities and districts.) Inner-city districts may generally have lower per-pupil funding levels than do districts in suburbs and smaller cities.

(c) Pilot Elementary Sample. This sample had lower regular per-pupil expenditures than did either of the Basic samples (see Table V-14). In total per-pupil expenditures (see Table V-15), the Pilot Elementary schools exceeded the Basic Secondary schools, but were still lower than the Basic Elementary treatment schools. Pilot control schools had higher total expenditures than did Basic Elementary or Basic Secondary control schools.

Among the Pilot Elementary schools, the longitudinal sample schools had larger regular and total per-pupil expenditures than did the Year Three cross-sectional sample schools. Within the cross-sectional sample, treatment and control schools had virtually equal levels of regular per-pupil expenditures, while total per-pupil expenditures in the treatment schools exceeded those in the control schools by about $130; this latter difference, it should be noted, amounts to only about 10 percent of the total funding in either experimental group.

(4) Summary of Treatment-Control Funding Differences

It is apparent from the results reported above that some differences in level of funding did exist between the paired treatment and control schools, and that these differences were generally attributable to differences in the levels of ESAA funding. Because of the importance of treatment-control funding differences to the evaluation design, these differences were analyzed to determine

TABLE V-14. PILOT ELEMENTARY SAMPLE: REGULAR PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional				Longitudinal			
	Treatment		Control		Treatment		Control	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$0-500	0	0.0	0	0.0	0	0.0	0	0.0
$501-600	1	7.7	1	7.7	0	0.0	1	11.1
$601-700	1	7.7	1	7.7	1	11.1	0	0.0
$701-800	3	23.1	3	23.1	2	22.2	2	22.2
$801-900	4	30.8	4	30.8	3	33.3	3	33.3
$901-1000	0	0.0	1	7.7	0	0.0	0	0.0
$1001-1100	2	15.4	1	7.7	1	11.1	1	11.1
$1101-1200	1	7.7	1	7.7	1	11.1	1	11.1
$1201-1400	0	0.0	0	0.0	0	0.0	0	0.0
$1401-1600	0	0.0	0	0.0	0	0.0	0	0.0
$1600+	1	7.7	1	7.7	1	11.1	1	11.1
TOTAL N	13		13		9		9	
$\bar{X}$	916.58		907.93		980.04		963.37	
S.D.	357.11		358.21		401.83		417.69	

TABLE V-15. PILOT ELEMENTARY SAMPLE: TOTAL PER-PUPIL EXPENDITURES IN PAIRED TREATMENT AND CONTROL SCHOOLS

Expenditure Level	Year Three Cross-Sectional				Longitudinal			
	Treatment		Control		Treatment		Control	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
$0-800	1	7.7	1	7.7	0	0.0	0	0.0
$801-1000	1	7.7	4	30.8	0	0.0	3	33.3
$1001-1100	2	15.4	2	15.4	1	11.1	1	11.1
$1101-1200	1	7.7	1	7.7	1	11.1	1	11.1
$1201-1300	2	15.4	1	7.7	2	22.2	1	11.1
$1301-1400	2	15.4	0	0.0	2	22.2	0	0.0
$1401-1500	1	7.7	2	15.4	1	11.1	2	22.2
$1501-1700	1	7.7	0	0.0	1	11.1	0	0.0
$1701-1900	0	0.0	1	7.7	0	0.0	0	0.0
$1901-2100	1	7.7	0	0.0	0	0.0	0	0.0
$2101-2300	1	7.7	0	0.0	1	11.1	0	0.0
$2300+	0	0.0	1	7.7	0	0.0	1	11.1
TOTAL N	13		13		9		9	
$\bar{X}$	1335.90		1205.90		1409.40		1265.20	
S.D.	395.61		490.23		325.80		515.89	

their statistical significance. Paired t-tests on differences between treatment and control means were performed within each cross-sectional sample, for each type of expenditure (i.e., ESAA, non-ESAA, total supplemental, regular, and total per-pupil). Results of these analyses are presented in the following paragraphs.

(a) Basic Elementary Sample. A statistically significant (two-tailed, $p < .01$) treatment-control difference favoring treatment schools was found in ESAA per-pupil expenditures (see Table V-1). Statistically significant differences favoring treatment schools were also found in total supplemental (two-tailed, $p < .05$) and total per-pupil expenditures (two-tailed, $p < .05$) (see Tables V-5 and V-11). The differences between the two groups in non-ESAA supplemental expenditures and regular district expenditures were not significant.

While statistical tests of significance yield some insights into the treatment-control funding differences, it is also important to determine the size of these differences relative to baseline expenditure levels. For example, total per-pupil expenditures for ESAA participants in treatment schools were around $380 higher than the expenditures for ESAA-eligible students in control schools. This represents a potentially important difference in resources and services between treatment and control schools.

(b) Basic Secondary Sample. No statistically significant funding differences (two-tailed, $p < .05$) were found between treatment and control schools in this sample. The average treatment-control difference in total per-pupil expenditure was less than $90. It is highly questionable, therefore, whether the treatment and control schools should be considered two meaningfully different groups in terms of funding level.

(c) Pilot Elementary Sample. Results for this sample were similar to those reported for the Basic Secondary schools, except for a statistically significant (two-tailed, $p < .05$) treatment-control difference in ESAA per-pupil expenditure (see Table V-3). The mean difference between the paired schools in total per-pupil expenditure was only about $130, or roughly 10 percent of the total expenditure per ESAA participant in the treatment schools.

b. Allocation of Supplemental Funds

Patterns of expenditure allocations provide an important insight into the priorities of treatment and control schools. This section describes the allocation patterns of the treatment and control schools, and examines whether these patterns were different for funds from different sources.

(1) ESAA Supplemental Expenditures

This subsection describes the allocation of ESAA funds in treatment schools only, as ESAA expenditures in control schools are presumed in most instances to have been at grade levels not covered by this evaluation. Categories of ESAA-supported activities included in this discussion are the 10 program areas designated in ESAA regulations as appropriate for ESAA expenditures. These areas are reading, math, guidance and counseling, health services, new curricula, intergroup and cultural enrichment, career education, community activities, administrative and auxiliary services, and "other costs" (fringe benefits, travel, etc.). Data presented below for each sample (see Tables V-16 through V-18) include the mean value (across schools) and standard deviation of the percentages of total ESAA funds spent by the sample schools for each of the 10 activity areas. (These tables also include allocation data for non-ESAA supplemental and total supplemental funds, which are discussed in later sections of this chapter.) Only the schools that had some supplemental funds were used in the calculation of the percentage allocations.

(a) Basic Elementary Sample. Table V-16 shows that in this sample, over half the ESAA money was spent on reading, and almost another fifth on math instruction. The "other costs" category accounted for about eight percent of the money.

TABLE V-16. BASIC ELEMENTARY SAMPLE: PERCENTAGE ALLOCATIONS OF SUPPLEMENTAL FUNDS IN PAIRED TREATMENT AND CONTROL SCHOOLS*

Group		Type of Funding	Reading	Math	Guidance and Counseling	Health Services	New Curricula	Intergroup and Cultural Enrichment	Career Education	Community Activities	Administrative and Auxiliary Services	Other Costs
Year Three Cross-Sectional and Longitudinal**	Treatment	Total	56.3	21.0	2.6	0.2	5.3	0.4	0.1	0.8	4.7	8.6
		(N=20)	25.5	18.5	5.0	0.7	22.3	1.3	0.4	1.7	4.9	14.8
		Non-ESAA	61.9	18.1	1.1	0.5	8.4	0.0	0.3	0.3	3.4	6.1
		(N=12)	27.6	19.3	1.8	1.2	28.9	0.2	0.6	0.8	3.9	12.6
		ESAA	52.0	18.2	7.3	0.0	6.5	1.2	0.0	0.7	5.8	8.2
		(N=20)	31.9	19.9	20.3	0.0	22.9	4.7	0.2	1.6	5.7	15.2
	Control	Total	55.9	5.0	2.5	0.7	14.4	0.0	0.3	0.4	5.3	15.6
		(N=7)	34.1	8.6	3.3	1.0	37.8	0.0	0.7	0.7	6.2	23.9
		Non-ESAA	50.2	5.8	17.7	1.7	16.8	0.0	0.5	0.7	3.4	3.3
		(N=6)	39.7	9.5	37.8	2.1	40.8	0.0	1.1	1.0	3.0	5.5

*The upper figure in each cell is the mean percentage across sample schools, and the lower figure is the standard deviation of the percentages.

**Basic Elementary cross-sectional and longitudinal samples were identical.

TABLE V-17. BASIC SECONDARY SAMPLE: PERCENTAGE ALLOCATIONS OF SUPPLEMENTAL FUNDS IN PAIRED TREATMENT AND CONTROL SCHOOLS*

Group		Type of Funding	Reading	Math	Guidance and Counseling	Health Services	New Curricula	Intergroup and Cultural Enrichment	Career Education	Community Activities	Administrative and Auxiliary Services	Other Costs
Year Three Cross-Sectional	Treatment	Total (N=13)	48.8 24.3	15.7 19.3	1.7 6.3	0.0 0.0	0.5 1.8	14.5 26.1	1.8 4.5	4.5 12.5	5.5 7.1	7.0 6.0
		Non-ESAA (N=4)	67.3 43.1	12.3 19.0	0.0 0.0	0.0 0.0	13.6 27.3	0.0 0.0	0.0 0.0	0.0 0.0	4.5 9.1	2.3 4.5
		ESAA (N=13)	39.8 29.9	14.7 19.8	1.9 6.7	0.0 0.0	0.0 0.0	23.5 41.1	2.2 5.4	4.5 12.5	6.3 9.9	7.2 6.0
	Control	Total (N=4)	60.1 16.9	11.6 22.6	5.6 11.3	0.0 0.0	1.6 3.2	0.0 0.0	3.3 6.6	0.0 0.0	6.1 4.5	11.6 2.2
		Non-ESAA (N=1)	9.1 0.0	9.1 0.0	0.0 0.0	0.0 0.0	54.5 0.0	0.0 0.0	0.0 0.0	0.0 0.0	18.2 0.0	9.1 0.0
Longitudinal	Treatment	Total (N=6)	39.2 27.9	18.3 20.6	3.8 9.2	0.0 0.0	1.1 2.6	17.7 33.4	0.0 0.0	7.3 17.9	3.2 3.4	9.4 5.3
		Non-ESAA (N=1)	9.1 0.0	9.1 0.0	0.0 0.0	0.0 0.0	54.5 0.0	0.0 0.0	0.0 0.0	0.0 0.0	18.2 0.0	9.1 0.0
		ESAA (N=6)	40.1 28.6	18.2 20.8	4.0 9.8	0.0 0.0	0.0 0.0	17.7 33.4	0.0 0.0	7.3 17.9	3.1 3.4	9.6 5.3
	Control	Total (N=2)	68.1 18.8	0.5 0.8	11.3 16.0	0.0 0.0	3.2 4.6	0.0 0.0	0.0 0.0	0.0 0.0	7.1 2.4	9.7 0.1
		Non-ESAA (N=1)	9.1 0.0	9.1 0.0	0.0 0.0	0.0 0.0	54.5 0.0	0.0 0.0	0.0 0.0	0.0 0.0	18.2 0.0	9.1 0.0

*The upper figure in each cell is the mean percentage across sample schools, and the lower figure is the standard deviation of the percentages.

TABLE V-18. PILOT ELEMENTARY SAMPLE: PERCENTAGE ALLOCATIONS OF SUPPLEMENTAL FUNDS IN PAIRED TREATMENT AND CONTROL SCHOOLS*

Group		Type of Funding	Reading	Math	Guidance and Counseling	Health Services	New Curricula	Intergroup and Cultural Enrichment	Career Education	Community Activities	Administrative and Auxiliary Services	Other Costs
Year Three Cross-Sectional	Treatment	Total (N=12)	51.6 33.7	12.7 15.0	1.6 4.8	0.4 1.1	19.2 37.4	0.1 0.3	0.3 0.8	1.9 2.4	6.2 5.4	5.9 6.5
		Non-ESAA (N=7)	48.7 28.9	17.2 17.8	4.2 10.3	1.3 2.4	10.3 26.4	0.3 0.8	0.7 1.9	2.0 2.8	4.9 3.1	10.5 7.6
		ESAA (N=12)	54.5 36.1	13.4 22.5	0.1 0.2	0.1 0.2	16.5 37.4	0.0 0.0	0.3 1.1	2.4 4.8	7.7 7.6	5.2 6.4
	Control	Total (N=8)	57.2 32.2	8.8 15.8	4.4 7.6	0.7 1.4	11.8 26.1	0.0 0.0	0.4 0.9	1.3 1.8	6.7 6.2	8.6 7.2
		Non-ESAA (N=6)	47.9 30.6	17.7 19.9	3.3 7.1	1.3 2.0	15.4 29.8	0.0 0.0	0.5 1.0	0.8 1.0	4.3 3.1	8.8 7.8
Longitudinal	Treatment	Total (N=9)	41.9 32.8	12.9 16.0	2.1 5.6	0.6 1.2	25.5 41.7	0.1 0.4	0.4 0.9	1.9 2.2	8.0 5.0	6.6 7.0
		Non-ESAA (N=6)	51.0 30.9	12.3 13.5	4.9 11.1	1.5 2.6	12.0 28.5	0.4 0.9	0.8 2.1	2.3 3.0	4.4 3.0	10.4 8.3
		ESAA (N=9)	44.9 36.3	14.6 24.9	0.1 0.2	0.1 0.3	22.0 42.3	0.0 0.0	0.4 1.3	2.3 5.3	10.0 7.5	5.6 7.0
	Control	Total (N=6)	46.3 29.1	11.6 17.7	5.9 8.4	1.0 1.5	15.7 29.7	0.0 0.0	0.5 1.0	0.9 0.8	8.5 6.2	9.5 7.8
		Non-ESAA (N=5)	48.2 34.2	13.5 19.1	4.0 7.7	1.5 2.1	18.5 32.3	0.0 0.0	0.6 1.1	1.0 1.0	3.6 3.0	9.1 8.7

*The upper figure in each cell is the mean percentage across sample schools, and the lower figure is the standard deviation of the percentages.

(b) Basic Secondary Sample. As shown in Table V-17, the largest portion of ESAA expenditures in sample secondary schools (about 55 percent) was for basic skills instruction, particularly reading. However, the area of intergroup and cultural enrichment also received substantial ESAA support, accounting in the cross-sectional sample for about 24 percent of total ESAA funds. Another 13 percent of the money went into administrative and "other" expenditures.

(c) Pilot Elementary Sample. The results for this sample (Table V-18) were much like those for the Basic Elementary sample. Again, the major expenditures (around 70 percent) were in the areas of reading and mathematics. Pilot schools spent a larger percentage of their ESAA funds for new curriculum development than did Basic schools. Almost eight percent of ESAA money was spent on administrative and auxiliary services in the Pilot sample; this figure is higher than that for either Basic sample, although the combined total of this category and "other costs" is similar across the three samples.

(2) Non-ESAA and Total Supplemental Expenditures

Allocation patterns of non-ESAA and total supplemental expenditures provide a basis for comparing priorities of treatment and control schools, particularly with respect to activities having apparent direct relevance to this study's outcome measures. The following paragraphs discuss treatment-control allocation differences and compare allocation patterns of ESAA and non-ESAA funds, for each sample.

(a) Basic Elementary Sample. As shown in Table V-16, treatment schools allocated their non-ESAA supplemental funds in a somewhat different pattern from that of control schools. While there was a consistent emphasis on reading, mathematics was treated very differently in treatment and control schools. Control schools allocated only about 5 percent of their money to mathematics, while the treatment schools allocated almost 20 percent. This comparison should be interpreted with some caution, however, as the control-group estimates are based on a small sample.

Also of interest is the finding that ESAA funds were allocated to various activities in almost the same proportions as non-ESAA supplemental funds. In effect, then, the ESAA funds were treated as add-on money for the normal budgetary pattern of supplemental expenditures.

(b) Basic Secondary Sample. Basic Secondary schools showed less clear-cut differences between treatment and control allocations of supplemental funds than did Basic Elementary schools. As can be seen in Table V-17, the treatment schools reportedly allocated a smaller proportion of their total supplemental funds to reading, but a larger percentage to mathematics, than did the control schools. Table V-17 also shows that the treatment schools placed greater funding emphasis than the control schools on intercultural enrichment. The control schools spent more supplemental funding on "other costs."

The treatment schools also showed differences between their allocations of ESAA and non-ESAA funds. Non-ESAA expenditures were more heavily focused on reading instruction and new curricula. ESAA funds were directed toward intergroup and cultural enrichment activities. It might be expected, therefore, that any impact of ESAA funds in treatment schools would appear more in the area of intercultural relations and less in reading and mathematics skills.

(c) Pilot Elementary Sample. The Pilot Elementary sample showed few large differences between treatment and control schools' allocations of non-ESAA and total supplemental funds (see Table V-18). Treatment schools spent smaller proportions of their total supplemental funds than did control schools on reading instruction, and larger proportions on mathematics and new curriculum development. Control schools concentrated heavily (over 65 percent of total supplemental funds) on reading and math instruction, and more heavily than treatment schools on the area of guidance and counseling.

Patterns of allocation were distinctly different for ESAA and non-ESAA funds. A larger percentage of ESAA funds than of non-ESAA funds was spent on reading.

ESAA funds were also invested more liberally for new curricula. Non-ESAA funds were used more in the areas of "other costs" and guidance and counseling.

These results suggest that the addition of ESAA funds to treatment schools may have spurred greater emphasis on reading instruction in those schools. However, because of compensating trends in the use of non-ESAA funds, treatment and control schools showed little overall difference in the emphasis given to basic skills instruction.

(3) Summary of Treatment-Control Differences in Allocations of Supplemental Funds

Treatment-control comparisons were approached in two ways. First, paired t-tests were performed on the differences in percentage allocations for the 10 areas of program activity. Second, differences in actual dollar allocations for the 10 areas were investigated with paired t-tests. In both sets of analyses, all pairs of schools were used, regardless of whether they had supplemental money. The rationale for this decision was that the comparisons were intended to determine whether ESAA participants in the treatment schools received greater funds for particular activities; therefore, it was considered appropriate to compare the matched schools even if one of the pair had no supplemental funds. (Appendices V-A, V-B, and V-C show the group means used in these comparisons.)

(a) Basic Elementary Sample. The paired t-tests for the 10 allocation categories yielded significant treatment-control differences in allocations related to basic skills areas. The treatment schools allocated significantly larger (two-tailed, $p < .01$) percentages of supplemental funds to the areas of reading and math instruction; further, a significantly heavier (two-tailed, $p < .01$) emphasis on intergroup and cultural enrichment was apparent in treatment schools. These differences seem particularly important, since they involve activities directly related to the study's outcome measures (reading and math achievement, and school climate). A similar pattern of significant differences favoring treatment schools ($p < .05$) was evident in actual dollar allocations. Thus, with respect to the allocations of supplemental funds, at least, the treatment schools appear to have had resource advantages that might be expected to produce outcome differences favoring those schools.

(b) Basic Secondary Sample. As in the Basic Elementary sample, Basic Secondary treatment schools had significantly higher percentage allocations than did control schools for reading and mathematics (two-tailed, $p < .05$). In actual dollars, however, the allocation differences were only $50 per pupil in reading and $17 in mathematics; neither difference was statistically significant. Treatment schools spent significantly larger ($p < .05$) percentages of their supplemental funds for intergroup and cultural enrichment, but again, the differences in actual dollar allocations were small.

(c) Pilot Elementary Sample. Paired t-tests of dollar allocations for treatment and control schools in this sample showed statistically significant differences only in activities not directly related to basic skills instruction. Specifically, the treatment schools had significantly larger expenditures and percentage allocations in the area of intergroup and cultural enrichment (two-tailed, $p < .05$). Even here, the actual dollar difference was less than one dollar per pupil. Overall, results of these comparisons of supplemental allocations gave little reason to expect treatment-control outcome differences (i.e., program impact) for the Pilot sample.

(4) Comparison of Allocation Patterns Across Three Years

This section examines possible differences in funding priorities among the three years of the evaluation. Year One allocation information was available for only three areas: reading, mathematics, and "other." The "other" category represented a sum of expenditures in the eight remaining categories reported above for the Year Three data.

(a) Basic Elementary Sample. According to the percentage allocation figures shown for the cross-sectional samples in Table V-19, there was a great deal of consistency across the three years in the area of reading. The only noticeable shift was a substantial drop in the control schools' allocation to the area of mathematics (from 20 percent in Year Two to 5 percent in Year Three). This finding may result from the Year Three calculation procedures, which in the control schools examined only those funds directed toward ESAA-eligible students.

(b) Basic Secondary Sample. Table V-19 shows an increasing emphasis on reading in this sample. This trend was particularly noticeable in the control schools, where the percentage of supplemental money spent on reading increased from 20 percent in Year One to 60 percent in Year Three. Within the treatment schools, there was a general decrease in percentage allocation for math instruction over the three years, accompanied by a generally increasing trend in the "other" category. This trend may be indicative of a greater emphasis in areas such as guidance, career education, and intergroup and cultural enrichment.

(c) Pilot Elementary Sample. This sample showed some fluctuation in percentage allocation of supplemental expenditures across the three years. Treatment schools tended to spend about half their money on reading, but the actual percentage fluctuated from 58 percent in Year One, to 45 percent in Year Two, to 52 percent in Year Three. A somewhat similar pattern was in evidence for the control schools. There was a pattern of consistently low expenditures for mathematics across the three years, in both treatment and control schools.

c. Relationship Between Funding and Students' Academic Needs

An important issue concerning supplemental funds is whether they were directed toward schools having students with the greatest needs. This section of the report examines relationships between the sample schools' expenditures, both regular and supplemental, and indicators of needs of the students and of the schools. For purposes of this discussion, a need is defined here as a low

TABLE V-19. MEAN PERCENTAGE ALLOCATIONS OF SUPPLEMENTAL EXPENDITURES FOR THREE YEARS IN SAMPLE SCHOOLS

Focus	Basic Elementary Sample					
	Year One		Year Two		Year Three	
	Treatment	Control	Treatment	Control	Treatment	Control
Reading	55	54	55	54	56	56
Mathematics	18	14	22	20	21	5
Other	27	32	23	26	23	39

Focus	Basic Secondary Sample					
	Year One		Year Two		Year Three	
	Treatment	Control	Treatment	Control	Treatment	Control
Reading	37	20	43	49	49	60
Mathematics	33	27	25	34	16	12
Other	30	53	32	17	35	28

Focus	Pilot Elementary Sample					
	Year One		Year Two		Year Three	
	Treatment	Control	Treatment	Control	Treatment	Control
Reading	58	62	45	55	52	57
Mathematics	13	15	13	16	13	9
Other	27	23	42	29	35	34

pretest score on an achievement test. Analyses were also performed using School Climate Questionnaire (SCQ) pretest scores as measures of need in the domain of race-related school climate; however, possibly because of the poor psychometric characteristics of the SCQ scales (as reported in Chapter IV), those scores showed little relationship to expenditures, and the analyses using climate data are not discussed further in this section.

Two procedures were used to examine the relationships of funding variables to indices of need. First, Pearson product-moment correlations were computed between the funding variables and each indicator of need. (The actual coefficients are contained in Appendix V-D.) Second, because of the interrelationships known or presumed to exist among funding variables, a stepwise multiple regression was also used to examine the relationships of funding variables to indices of need. Parallel analyses were conducted for the treatment and control schools, to permit examination of treatment-control differences in those relationships, and to focus on the use of ESAA funds in the treatment schools.

It should be noted that neither of the statistical procedures used here gives any direct evidence concerning possible causal relationships. That is, a positive statistical relationship between need and expenditures, if found, would not prove that funds were directed to a particular school or activity because of an identified need. However, the findings can be helpful in determining whether patterns of association existed.

(1) Basic Elementary Sample

In both treatment and control schools, significant positive correlations were found between initial performance in the basic skills, and level of regular per-pupil expenditures; that is, expenditures tended to be larger in schools with higher achievement pretest scores. Because regular district funds constitute the major portion of all districts' total budgets, it is not surprising that there was also a significant positive correlation between pretest scores and total per-pupil expenditures. Both of these trends were found in the data for Year Two, as well. What is somewhat surprising, however, is that supplemental per-pupil expenditures were also higher in schools with higher pretest performance. That is a reversal from the trend in Year Two, when heavier supplemental funding was found in schools with lower initial achievement. This positive correlation between supplemental per-pupil expenditures and pretest scores persisted even when the older calculation procedures (those applied in Years One and Two) were used to compute the Year Three per-pupil expenditures. (See Chapter VI, Section E.1, for a comparison of the Year Two and Year Three calculation procedures.) Thus, it does not appear that the Year Three shift in direction of relationship between supplemental expenditures and pretest scores was to any major extent an artifact of changes in computation techniques.

Another possible explanation for this shift was the loss of about a third of the Basic Elementary sample schools between Years Two and Three; that is, perhaps the schools lost by sample attrition had a markedly different relationship between supplemental expenditures and pretest scores from that of the schools retained in the Year Three sample. If this explanation were valid, one would expect that a recalculation of the Year Two correlations, based only on the schools that were retained in the Year Three sample, would produce correlations similar in direction and magnitude to the Year Three correlations. In actuality, however, this recomputation resulted in correlations quite similar to the original Year Two figures, with only a small movement in the direction of the Year Three results. For example, the Year Two recalculations produced treatment group correlations of -0.07 (reading) and 0.05 (mathematics); these certainly show closer resemblance to the original (full-sample) Year Two correlations (-0.13 and -0.01 for reading and math, respectively) than to the Year Three figures (0.36 and 0.29, respectively). Thus, the school-level sample attrition does not appear to be the major explanation for the change in relationship between supplemental funding and needs. Conceivably, that change might derive from student-level attrition, or from some modification in the pattern of funding allocations; we are unaware, however, of any policy change at the national or local level that would explain such a modification.

The multiple regression analysis of these results provides some insight into the relative importance of the expenditure variables. For treatment schools, ESAA expenditures, non-ESAA supplemental expenditures, and regular funding were positively and strongly predictive ($R = .64$ and $.57$ for reading and math) of initial high achievement. Of these, ESAA funding was the least important predictor (F-ratio, $p < .05$) of performance. In the control schools, only regular district funds were significantly (F-ratio, $p < .05$) predictive of initial academic level. The relationship was positive ($r = .44$ and $r = .47$) for both reading and mathematics.

(2) Basic Secondary Sample

Results for both the treatment and control schools indicated that regular funds and total per-pupil expenditures were positively and significantly (two-tailed, $p < .05$) related to initial performance in reading and math. Supplemental per-pupil expenditures tended to be higher in schools with lower pretest scores, suggesting some targeting of such funds to needier schools; however, none of these correlations were statistically significant. Regression analyses revealed no significant trends in the data.

(3) Pilot Elementary Sample

This sample showed no statistically significant relationships between pretest scores and school expenditures. There was, however, a general tendency for supplemental expenditures to be larger and regular district expenditures smaller in schools with greater academic need (i.e., lower pretest scores); this finding is consistent with relationships reported in the Year Two data, and suggests possible targeting of supplemental funds to the needier schools.

To examine further the relationships between funding and needs, correlations were calculated between the level of supplemental funds specifically allocated for reading and math instruction, and the pretest scores in reading and math. A statistically significant ($p < .05$) negative correlation (-.49) was found in treatment schools between reading allocations and reading pretest scores; in addition, the treatment schools showed a negative correlation (-.32) approaching the .05 significance level between math allocations and math pretest scores. The control schools showed no significant correlations between allocations and pretest scores. Thus, there is at least a tentative indication in the Year Three Pilot sample data that allocations for specific instructional areas were greatest where the need was greatest, and that this matching of funds to needs was stronger among ESAA-funded schools.

3. SUMMARY OF RESULTS: EXPENDITURES

A major goal in analyzing the sample schools' expenditure data was to determine the extent of funding differences between the paired treatment and control schools. The evaluation design originally assumed that treatment and control schools would receive equal funding from regular district sources and from non-ESAA supplemental program sources, and that only treatment schools would receive ESAA funds. Thus, the total per-pupil funding in treatment schools should have been greater than that in control schools by the amount of the treatment schools' per-pupil ESAA funding.

Unfortunately for the research design, these assumptions about funding in treatment and control schools were cast into considerable doubt by events of the first two evaluation years. First, it seemed that some districts were giving more non-ESAA supplemental money to certain control schools than to their paired treatment schools, perhaps to "compensate" for the denial of ESAA funds to the control schools. Though anecdotal evidence indicated that this was occurring, the expenditure data being collected were not sufficiently fine-grained to permit a definitive confirmation.

In addition, a small number of control schools received ESAA funds, by agreement with USOE. (Such compromises were occasionally necessary in order to maintain the size of the longitudinal samples, especially in the case of the Basic Secondary and Pilot Elementary samples, which were already quite small.) In most such cases, the ESAA funds in control schools were targeted for grades other than those of concern in this study. Nevertheless, it seemed likely that the ESAA funds would have had an indirect influence on sample students in the control schools.

The extent of the deviations in funding patterns from the original design assumptions could not be determined precisely in Years One and Two, because funding data were available only for entire schools, rather than for the sample students in particular. Ideally, one would wish to know the exact funding targeted toward each sample student in the treatment and control schools. In Year Three, although this ideal goal was still unattainable, data were collected on the percentage of ESAA participants (or ESAA-eligible students, in the case of control schools) receiving funds from each source of supplemental expenditures. This information, in combination with total expenditure figures and data on the number of ESAA-participating (or ESAA-eligible) students in each school, permitted calculations of meaningful per-pupil expenditure estimates for the populations of disadvantaged students from which the evaluation samples were drawn. The results of these more detailed calculations, particularly with respect to treatment-control funding differences, are summarized below.

- Per-Pupil ESAA expenditures in Basic Elementary treatment schools averaged over $320, while in control schools they averaged only $34. In Basic Secondary schools, however, the treatment-control difference in ESAA funding ($91 per pupil in treatment schools, $32 in control schools) was much reduced, and in the Pilot sample, ESAA funding in the control schools ($168 per pupil) was over half as large as that in the treatment schools ($329).

One explanation for the "leakage" of ESAA dollars into control schools is that some of those schools were allowed to spend ESAA funds in grades not involved in this study. In addition, some control schools used ESAA funds at the grade levels of interest, but not for students participating in the study. More such compromise arrangements were made with schools in Year Three than in previous years, in an attempt to maintain adequate longitudinal samples. Despite efforts to minimize contamination of ESAA funding variables with respect to the sample students, the strong possibility of such contamination in the Basic Secondary and Pilot Elementary samples cannot be discounted.

- Per-pupil non-ESAA supplemental expenditures for the Basic Elementary sample were substantially larger in treatment schools ($196) than in control schools ($95); in this sample, a considerable effort was apparently made to focus discretionary funds of all categories on the treatment schools. By contrast, non-ESAA supplemental funds in Basic Secondary schools, both treatment and control, were negligible. In the Pilot sample, control schools received more non-ESAA supplemental funding ($130 per pupil) than did treatment schools ($91); this finding may indicate an attempt by Pilot districts to "compensate" for ESAA funds denied to the control schools.

- Total per-pupil expenditures for the Basic Elementary sample were significantly higher (.05 level) in treatment schools ($1,549) than in control schools ($1,169). In the Basic Secondary and Pilot Elementary samples, although the funding differences favored the treatment schools, the differences were not statistically significant. Thus, only in the Basic Elementary sample was there a clear-cut treatment-control funding distinction of the type originally assumed in the study's experimental design.

- Allocations of supplemental funds for different types of school activities were examined. Not surprisingly, more than half the total supplemental funds in all three evaluation samples were spent for basic skills instruction. Only the Basic Elementary sample showed significant (two-tailed, $p < .01$) treatment-control differences in actual dollar allocations and in the percentages of funds allocated for activities having logical relationships to the outcome measures. Specifically, in this sample, treatment schools spent more supplemental funds than did control schools for reading and math instruction, and for intergroup and cultural enrichment activities. Again, it appears that if any significant ESAA program impact is to be found in the Year Three data, this impact should be found in the Basic Elementary sample.

- As in Year Two, all three samples showed greater regular and total per-pupil expenditure levels in schools with higher achievement pretest scores. However, in contrast with the Year Two findings, the Basic Elementary sample in Year Three also showed higher supplemental per-pupil expenditures in schools with higher pretest scores. Thus, the Basic Elementary sample data for Year Three failed to support the earlier finding of targeting of supplemental funds toward schools with the greatest academic needs; this change in direction of relationships between need and expenditures does not appear to be a function of school-level sample changes between Years Two and Three, but could conceivably reflect student-level changes. Both the Basic Secondary and Pilot Elementary samples showed a general pattern of higher supplemental per-pupil expenditures in schools with greater academic need (i.e., lower pretest scores), but the correlations between those measures were not statistically significant.

B. SERVICES

This section describes the sample schools' academic, intercultural, and desegregation activities that appear to be related to ESAA objectives. In the interest of brevity, the discussion focuses on program variables that were found either to have special relevance to the impact or relational analyses (see Chapters VI and VII), or to show statistically significant treatment-control differences. Other characteristics are summarized in tabular form in Appendix V-E.

Most information discussed here was obtained from teacher responses to self-administered questionnaires. (In the few instances where data were obtained from principal or student responses, this is noted in the tables.) Tables report either the percentage of teachers selecting a category (e.g., the percentage of teachers indicating they received inservice training), or the average of values reported, such as minutes per day in math activities. Mean estimates may be underestimates, since they were derived from categorical data in which the highest category was open-ended, e.g., five or more hours.

Treatment-control comparisons were performed for all variables reported in this section or summarized in Appendix V-E; Student's t-test was used for comparisons of means, and the chi-square test was used for comparisons of frequency distributions. Because of the large number of tests performed, and the consequent likelihood that at least a few treatment-control differences would reach significance by chance alone, the discussion here concentrates on consistent patterns of differences rather than on isolated instances.

1. ACADEMIC PROGRAMS

Selected aspects of the regular and remedial reading (English) and mathematics programs in the three cross-sectional samples are described in this subsection. Program variables that were related to the outcome variables or that showed statistically significant treatment-control differences are discussed in the body of the report. These variables include class size, student time in instructional activities, teachers' special training, personnel time in instructional activities, teacher participation in school decision-making, and personnel-community involvement in the planning and evaluation of compensatory programs. In addition, an index provides an estimate of costs associated with various patterns of personnel time allocations. Total resource cost estimates are used to assess the relationships between the services provided and the academic needs of the students.

Other program elements were examined and may be of interest to some readers. Therefore, tables of characteristics that were not related to outcome variables or that showed no clear-cut patterns of treatment-control differences are presented in Appendix V-E. These characteristics include teacher training and years of experience, classroom physical characteristics and material use, basis of student class assignment, reading approaches and activities, mathematical activities, instructional individualization, and feedback to students.

Teachers were asked to respond to questionnaire items with reference to students participating in the ESAA evaluation, or (if they did not know which students were participants) with reference to the class with the largest number of educationally disadvantaged students. Therefore, the estimates represent the teachers' assessment of classroom activities of the educationally disadvantaged students.

Because program characteristics for reading instruction often differed substantially from those for mathematics, information is generally presented separately for the two instructional areas, despite the fact that in elementary schools, both areas were normally taught by the same teacher. Each teacher was asked to identify himself or herself either as a regular classroom teacher or as a remedial teacher or specialist. Instruction reported here as remedial teaching generally was in addition to, rather than instead of, regular classroom instruction.

a. Basic Elementary Sample

(1) Class Size

Classes in treatment schools averaged fewer students than did comparable classes in control schools; a statistically significant difference was found in the average size of the regular reading classes (see Table V-20). In both regular reading and regular math, twice as many control classes as treatment classes had more than 30 students.

TABLE V-20. CLASS SIZE: BASIC ELEMENTARY SAMPLE*

Type of Class	Number of Students	Regular		Remedial	
		Treatment	Control	Treatment	Control
Reading		(N=206)	(N=165)	(N=25)	(N=21)
	10 or fewer	11.0	7.3	60.0	52.4
	11 to 20	12.7	16.4	24.0	9.5
	21 to 30	67.0	55.7	8.0	23.8
	More than 30	9.3	20.6**	8.0	14.3
	Average	23.2	24.9**	12.0	15.9
Mathematics		(N=197)	(N=165)	(N=17)	(N=14)
	10 or fewer	1.5	3.0	35.3	21.4
	11 to 20	11.2	13.9	47.1	28.6
	21 to 30	79.2	66.1	5.9	42.9
	More than 30	8.1	17.0**	11.8	7.1
	Average	25.0	25.3	13.3	18.7

*Cell entries represent the percentage of responding teachers in each category.

**A statistically significant treatment-control difference ($p \leq .05$) is present.

(2) Student Time in Instructional Activities

Table V-21 presents teacher reports of the time per day spent by the typical student in various instructional activities. Data are shown for the total (treatment plus control) sample, since treatment-control differences were statistically nonsignificant.

TABLE V-21. STUDENT TIME IN INSTRUCTIONAL ACTIVITIES: BASIC ELEMENTARY SAMPLE*

Instructional Activity	Minutes per Day			
	Reading		Mathematics	
	Regular (N=369)	Remedial (N=45)	Regular (N=359)	Remedial (N=31)
Teacher and whole class	17.8	8.7	9.8	2.0
Teacher and small group	18.7	11.7	4.4	4.6
Teacher and individual student	9.4	7.9	3.2	4.6
Specialists and small group	11.9	20.6	2.9	9.2
Aide and small group	5.1	11.8	0.7	6.4
Adult tutor	2.8	6.1	0.6	1.9
Student tutor	4.2	5.4	0.5	0.6
Independent: programmed texts, etc.	13.2	14.5	4.1	7.7
Independent: dittos, workbooks	20.8	13.4	10.0	5.8
Independent: learning centers	9.7	10.5	2.0	6.1
Testing and evaluation	11.5	10.8	3.4	3.1
Total**	124.8	113.7	41.0	48.1

*Cell entries represent the average number of minutes per day spent by the typical student in each classroom activity, as reported by teachers.

**Total time in activities was computed only for teachers who provided data for all activity categories; therefore, this total does not necessarily equal the sum of the individual category means.

Students participated in reading activities for an average of two hours per day. In both the regular and remedial classes, about one-third of this time was spent in independent work, and about 10 minutes daily were used for testing and evaluation. Students spent about 45 minutes daily in mathematics activities; independent work accounted for about 15 minutes in the regular classroom and about 20 minutes in the remedial classroom.

(3) Teachers' Special Training

Participation in special training programs was examined in relation to the subject matter being taught; e.g., training in the teaching of reading was examined only for the reading teachers. Because the extent of teacher participation in inservice and non-inservice training was similar for treatment and control schools, results are reported in Table V-22 for the combined treatment and control groups.

Participation in both inservice and non-inservice training was greatest among the remedial reading teachers, almost all of whom received some training. Fewer remedial mathematics teachers received special training; however, those who received inservice mathematics training averaged 17.4 hours during the current year (about double the number of hours of any of the other groups).

(4) Personnel Instructional Time

Estimates in Table V-23 are based upon teacher reports of classroom instructional time and of amounts of teaching assistance from additional personnel. About five hours weekly of reading instruction was provided by the regular classroom teacher in both treatment and control schools. The treatment teachers were assisted by remedial specialists and paid aides for about one and one-half hours; this was approximately double the amount of assistance received by teachers in the control schools. In mathematics, the regular classroom teachers provided about four hours of instruction each week, with little assistance from other personnel.

TABLE V-22. TEACHERS' SPECIAL TRAINING IN READING AND MATHEMATICS: BASIC ELEMENTARY SAMPLE*

Type of Training	Extent of Participation**	Reading Teachers		Mathematics Teachers	
		Regular	Remedial	Regular	Remedial
Non-Inservice		(N=350)	(N=45)	(N=325)	(N=29)
	Within 1 year	18.9	37.8	13.8	24.1
	1 to 4 years	47.1	40.0	37.8	37.9
	5 or more years	23.4	20.0	32.9	20.7
	No training	10.6	2.2	15.4	17.2
Inservice		(N=346)	(N=46)	(N=341)	(N=29)
	No training	39.9	13.0	52.2	25.0
	10 or fewer hours	45.4	63.0	40.8	35.7
	11 to 20 hours	11.3	15.2	5.3	10.7
	More than 20 hours	3.5	8.7	1.8	28.6
	Average number of hours:				
	All teachers	5.2	8.3	3.6	13.0
	Participating teachers	8.7	9.5	7.6	17.4

*Cell entries represent the percentage of responding teachers in each category.

**"Extent of Participation" is defined as recency for non-inservice training; for inservice training, "Extent of Participation" is the number of hours in the current school year.

TABLE V-23. PERSONNEL INSTRUCTIONAL TIME: BASIC ELEMENTARY SAMPLE

Type of Class	Personnel Category	Hours per Week			
		Regular		Remedial	
		Treatment	Control	Treatment	Control
Reading		(N=207)	(N=164)	(N=24)	(N=20)
	Classroom teacher	5.2	5.5	n/a	n/a
	Remedial teacher or specialist	1.5*	0.8	3.1	3.7
	Speech therapist	0.5	0.3	0.2	0.4
	Counselor or psychologist	0.1	0.1	0.1	0.1
	Media specialist	0.2	0.1	0.3	0.2
	Paid paraprofessional or aide	1.4*	0.7	2.9	2.5
	Student teacher	0.4	0.4	0.5	0.0
	Parent or adult volunteer	0.1	0.1	0.1	0.0
	Student tutor	0.2	0.2	1.0*	0.1
Mathematics		(N=199)	(N=165)	(N=17)	(N=14)
	Classroom teacher	3.9	4.0	n/a	n/a
	Remedial teacher or specialist	0.4	0.4	3.1	3.2
	Counselor or psychologist	0.0	0.0	0.2	0.0
	Media specialist	0.1	0.1	0.4	0.0
	Paid paraprofessional or aide	0.5	0.6	0.6	0.4
	Student teacher	0.3	0.3	0.4	0.0
	Parent or adult volunteer	0.1	0.1	0.3	0.0
	Student tutor	0.3	0.3	0.5	0.2

n/a: not applicable

*The difference between the means of the treatment and control groups was significant at the .05 probability level.

In the remedial classrooms, specialists provided about three hours of instruction weekly in math and three in reading, and paid aides gave almost three hours of assistance in reading instruction. For remedial reading classes, student tutors were used significantly more in treatment schools (1.0 hour) than in control schools (0.1 hour).

(5) Personnel Allocation Cost Index

The personnel time allocations described in the preceding paragraphs indicate the levels of utilization of various personnel for reading and math instruction. However, the time allocations for different personnel categories cannot be added together to obtain a meaningful estimate of total personnel resources committed to a given type of instruction. Because of skill and salary differences, it would not be particularly useful, for example, to add the hours of a teaching aide to those of a reading specialist.

To provide a basis for determining total school staff resources committed to various areas of instruction, a personnel allocation cost index was developed. This index represents the nominal cost to the school per unit time and per student being instructed, for a particular personnel category. Such unit costs can then be aggregated across personnel categories and over time to calculate total per-pupil annual costs for each school in each instructional area. It should be noted, however, that costs calculated as described in this section do not represent the actual dollar costs for any individual classroom or combination of staff members; they are based on average salaries for schools rather than on specific individuals' salaries. The primary purpose of calculating such nominal cost figures is to provide a common metric--dollars--for comparing the relative school resource allocations to different instructional areas. For example, using this approach, it is possible to determine whether a given sample of schools committed greater per-pupil resources for regular reading instruction or for remedial reading instruction. Similarly, this approach permits treatment-control comparisons of resources committed to a given type of instruction.

Unlike the expenditure data presented in Section A of this chapter, the cost index information discussed here is derived from time allocation data for the specific grade level and classes from which the sample students were drawn. The earlier expenditure data, by contrast, represented school-level figures across all grade levels and classes. In addition, the cost index data, unlike the expenditure data, provide a breakdown into regular and remedial instruction. Although other, non-personnel resource categories, such as books and equipment, are not considered here, it should be noted that personnel salaries constitute over 80 percent of most schools' total budget.

A detailed description of the methods used to calculate the personnel allocation cost index is given in Appendix V-F. Briefly, the time allocation data on which the cost index was based were derived from teachers' estimates of the number of hours each week devoted to a given type of instruction (regular or remedial, reading or mathematics), and the number of hours of assistance from other personnel for each type of instruction. The estimates were aggregated by personnel category across all sample teachers in each school. The time estimate for each category was then weighted (multiplied) by an average salary figure for that category, and divided by the total number of students in the responding teachers' classes; the resulting figure was then multiplied by the number of weeks in the school year, to obtain a per-pupil, per-year cost estimate for that personnel category. Finally, costs for different personnel categories were summed to obtain total costs for the instructional area of concern.

Resulting cost estimates for the Basic Elementary sample are presented in Table V-24. These data indicate that greater personnel resources were being directed toward reading instruction in treatment schools than in control schools; these differences were not statistically significant, however, except in certain component categories (e.g., instructional aides and remedial specialists).

TABLE V-24. ANNUAL PER-PUPIL PERSONNEL COST ESTIMATES (DOLLARS): BASIC ELEMENTARY SAMPLE

Personnel Category		Reading				Mathematics			
		Regular		Remedial		Regular		Remedial	
		Treatment (N=20)	Control (N=20)	Treatment (N=20)	Control (N=20)	Treatment (N=20)	Control (N=20)	Treatment (N=20)	Control (N=20)
Classroom teachers	Mean	69	74	n/a	n/a	56	61	n/a	n/a
	Median	67	68	-	-	49	50	-	-
	S.D.	38	22	-	-	19	34	-	-
	Range	106-37	126-39	-	-	122-31	198-42	-	-
Remedial specialists	Mean	19*	10	68	61	6	5	42	36
	Median	17	8	65	40	0	0	28	0
	S.D.	17	10	48	67	9	8	53	50
	Range	66-0	31-0	169-0	198-0	35-0	28-0	207-0	198-0
Instructional aides	Mean	12*	5	34	19	9	5	20	20
	Median	9	2	1	1	2	2	0	0
	S.D.	11	5	43	32	17	4	35	46
	Range	42-0	15-0	126-0	95-0	63-0	63-0	126-0	190-0
Speech therapists	Mean	8	5	5	7	n/a	n/a	n/a	n/a
	Median	7	3	1	1	-	-	-	-
	S.D.	5	6	14	14	-	-	-	-
	Range	16-0	19-0	49-0	49-0	-	-	-	-
Counselors	Mean	2	1	5	2	1	0	0	0
	Median	1	1	0	0	0	0	0	0
	S.D.	3	1	9	5	3	0	0	0
	Range	14-0	4-0	27-0	41-0	14-0	1-0	1-0	1-0
Media specialists	Mean	5*	2	9	2	4*	0	1	1
	Median	2	1	0	0	1	0	0	0
	S.D.	7	2	19	5	7	1	4	3
	Range	22-0	7-0	76-0	15-0	29-0	2-0	17-0	15-0
Total**	Mean	115	98	118	94	75	71	63	56
	Median	103	96	89	88	61	61	40	0
	S.D.	39	26	96	98	39	36	86	94
	Range	210-57	147-45	297-0	287-0	199-40	198-45	334-0	387-0

n/a: not applicable

*The difference between the means of the treatment and control groups is significant at the .05 probability level.

**Column entries may not sum to the "total," because of roundings.

(6) Staff Decision-Making and Community Involvement

Teachers were asked to specify areas in which decisions were made either exclusively by the teacher or jointly with an administrator. Teachers in control schools generally reported they were included in the school decision-making process to a greater extent than did those in treatment schools (see Table V-25), particularly in instructional material selection, student grading procedures, and course content planning.

Teachers were also asked to identify persons actively involved in the development and evaluation of the school's compensatory reading and mathematics programs (see Table V-26). Teachers in control schools reported more active involvement by regular classroom teachers in compensatory reading program needs assessment than did their treatment counterparts. Teachers in treatment schools reported significantly more involvement by district personnel in the planning and development of the compensatory reading program than did teachers in control schools. District and school administrative personnel were more actively involved in compensatory program planning, development, and evaluation than they were in needs assessment, whereas parents and students were most involved in needs assessment.

b. Basic Secondary Sample

(1) Class Size

No statistically significant treatment-control differences were found in the average class size or in the distribution of students among the various sizes of the classes; therefore, data are presented in Table V-27 for the combined treatment and control schools. Classes averaged around 25 students, except for remedial reading classes, which had about 19 students each. Only 8 percent of the remedial reading classes had more than 30 students, in contrast with about 28 percent of the regular English classes.

TABLE V-25. TEACHER PERCEPTION OF DECISION-MAKING ROLE: BASIC ELEMENTARY SAMPLE*

Decision Area	Teacher Participation	
	Treatment (N=251)	Control (N=215)
Material selection	44.6	58.9**
Student class assignment	31.9	35.0
Grading procedures	49.6	64.3**
Co-curricular activities	48.4	54.6
Inservice requirements	25.7	30.8
Teacher class assignment	28.3	24.2
Setting school goals	43.0	50.9
Planning course content	55.1	65.1**

*Cell entries represent the percentage of responding teachers selecting each category.

**A statistically significant treatment-control difference ($p \leq .05$) is present.

TABLE V-26. INVOLVEMENT IN COMPENSATORY PROGRAM: BASIC ELEMENTARY SAMPLE*

Persons Involved	Program Area											
	Needs Assessment				Planning and Development				Evaluation			
	Reading		Mathematics		Reading		Mathematics		Reading		Mathematics	
	Treatment (N=226)	Control (N=164)	Treatment (N=203)	Control (N=158)	Treatment (N=226)	Control (N=164)	Treatment (N=203)	Control (N=158)	Treatment (N=226)	Control (N=164)	Treatment (N=203)	Control (N=158)
District personnel	28.3	28.7	25.6	24.7	58.8**	48.2	47.3	40.5	46.0	52.4	39.9	46.8
Principal and administrative staff	28.8	36.6	23.6	27.2	52.7	65.2	51.7	55.7	54.4	51.8	49.3	43.7
Remedial teachers	31.0	31.7	28.1	22.2	60.2	57.9	47.3	43.7	42.9	43.9	34.5	27.2
Regular teachers	30.1	41.5**	30.0	38.0	48.2	47.6	50.2	45.6	35.0	41.5	31.5	41.8
Parents	22.1	21.3	21.2	20.9	6.6	10.4	6.4	8.2	9.3	7.3	8.9	5.1
Students	19.9	15.9	20.7	15.8	7.5	6.1	7.4	3.8	7.1	4.3	6.9	5.1

*Cell entries represent the percentage of responding teachers selecting each category.

**A statistically significant treatment-control difference ($p \leq .05$) is present.

TABLE V-27. CLASS SIZE: BASIC SECONDARY SAMPLE*

Number of Students	Reading		Mathematics	
	Regular (N=219)	Remedial (N=38)	Regular (N=133)	Remedial (N=33)
10 or fewer	2.3	13.2	[illegible].5	3.0
11 to 20	11.0	44.7	6.0	24.2
21 to 30	58.9	34.2	71.4	54.6
More than 30	27.8	7.9	18.1	18.2
Average	26.7	18.8	25.9	24.5

*Cell entries represent the percentage of responding teachers in each category.

(2) Student Time in Instructional Activities

Students in remedial classes engaged in reading activities for about two hours daily, almost one hour of which was spent in independent work (see Table V-28). Students in regular English classes had slightly over one hour daily of reading activities; about one-third of the time (25 minutes) was used for independent work. Mathematical activities in both regular and remedial classes took about 30 minutes daily.

(3) Teachers' Special Training

Except for the remedial reading teachers, about 60 percent of the teachers received approximately 10 hours of inservice training during the current year (see Table V-29). A somewhat larger number (80 percent) of the remedial reading teachers received about 15 hours of training. Although the percentage of teachers participating in inservice training was generally smaller in the Basic Secondary sample than in the Basic Elementary sample (Table V-22), the number of hours of training received by participating teachers at the secondary level was greater in all areas except remedial mathematics.

TABLE V-28. STUDENT TIME IN INSTRUCTIONAL ACTIVITIES: BASIC SECONDARY SAMPLE*

Instructional Activity	Minutes per Day			
	Reading		Mathematics	
	Regular (N=222)	Remedial (N=37)	Regular (N=132)	Remedial (N=35)
Teacher and whole class	19.1	10.2	10.3	4.9
Teacher and small group	7.7	13.8	0.7	1.6
Teacher and individual student	8.7	10.8	4.5	8.6
Specialist and small group	2.8	11.6	0.1	2.1
Aide and small group	1.7	11.5	0.3	1.0
Adult tutor	1.2	5.8	0.1	0.0
Student tutor	2.7	2.2	0.5	0.7
Independent: programmed texts, etc.	6.3	17.0	0.8	8.6
Independent: dittos, workbooks	13.9	20.2	6.6	9.1
Independent: learning centers	4.7	13.9	0.4	0.7
Testing and evaluation	10.3	9.0	3.0	1.9
Total**	78.2	125.9	26.0	39.8

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*Cell entries represent the average number of minutes per day spent by the typical student in each classroom activity, as reported by teachers.

**Total time in activities was computed only for teachers who provided data for all activity categories; therefore, this total does not necessarily equal the sum of the individual category means.

TABLE V-29. TEACHERS' SPECIAL TRAINING IN READING AND MATHEMATICS: BASIC SECONDARY SAMPLE*

Type of Training	Extent of Participation**	Reading Teachers		Mathematics Teachers	
		Regular	Remedial	Regular	Remedial
Non-Inservice		(N=210)	(N=37)	(N=122)	(N=33)
	Within 1 year	18.6	35.1	19.7	30.3
	1 to 4 years	34.3	48.6	45.1	42.4
	5 or more years	21.4	8.1	25.4	24.2
	No training	25.7	8.1	9.8	3.0
Inservice		(N=208)	(N=33)	(N=122)	(N=30)
	No training	43.3	18.2	43.4	40.0
	10 or fewer hours	38.9	42.4	41.0	50.0
	11 to 20 hours	11.5	18.2	10.7	6.7
	More than 20 hours	6.2	21.2	4.9	3.3
	Average number of hours:				
	All teachers	5.7	12.4	5.4	5.0
	Participating teachers	10.1	15.1	9.6	8.3

*Cell entries represent the percentage of responding teachers in each category.

**"Extent of Participation" is defined as recency for non-inservice training; for inservice training, "Extent of Participation" is the number of hours in the current school year.

(4) Personnel Instructional Time

Because no statistically significant treatment-control differences were found in personnel instructional time allocations, Table V-30 presents data for the combined sample. In the regular classrooms, English teachers provided about three hours of instruction weekly; math teachers, about four hours. Little assistance was received from supplementary personnel.

Specialists provided about four hours of instruction weekly in both remedial reading and remedial math classrooms. Reading teachers received about three hours of assistance from paid instructional aides and about an hour from student tutors, and math teachers received about half as much time from each of these types of personnel.

TABLE V-30. PERSONNEL INSTRUCTIONAL TIME:
BASIC SECONDARY SAMPLE

Personnel Category	Hours per Week			
	Reading		Mathematics	
	Regular (N=225)	Remedial (N=38)	Regular (N=133)	Remedial (N=33)
Classroom teacher	3.2	n/a	4.0	n/a
Remedial teacher or specialist	0.5	4.0	0.1	4.1
Speech therapist	0.1	0.4	n/a	n/a
Counselor or psychologist	0.1	0.2	0.1	0.3
Media specialist	0.1	0.2	0.1	0.1
Paid paraprofessional or aide	0.4	3.0	0.5	1.2
Student teacher	0.3	0.6	0.2	0.0
Parent or adult volunteer	0.0	0.1	0.1	0.2
Student tutor	0.0	1.2	0.5	0.6

n/a: not applicable

(5) Personnel Allocation Cost Index

There were no statistically significant treatment-control differences in personnel cost allocations; therefore, data are presented in Table V-31 for the combined sample. The largest personnel resource allocation ($74) was in the remedial reading area, with the remedial specialist and instructional aides accounting for most of the total. The annual per-pupil regular reading instructional cost was $52, slightly less than both the regular ($62) and remedial ($55) math personnel cost allocations.

(6) Staff Decision-Making and Community Involvement

No statistically significant differences were found between teachers in treatment and control schools in either of the areas examined in this subsection; therefore, tables are presented for the combined treatment-control sample. Teachers reported greatest decision-making authority in planning course content and grading students (Table V-32). Teacher involvement in the compensatory programs was greatest in the area of planning and development (Table V-33). Active involvement of parents and students in needs assessment was reported by about 20 percent of the teachers (over twice the number reporting participation of parents and students in program planning and development, or in program evaluation).

c. Pilot Elementary Sample

For this sample, descriptive analyses combining the treatment and control groups were based on three more schools than were the analyses comparing treatment and control school characteristics. The extra three schools were treatment schools for which there were no paired control schools.

TABLE V-31. ANNUAL PER-PUPIL PERSONNEL COST ESTIMATES (DOLLARS): BASIC SECONDARY SAMPLE

Personnel Category		Reading		Mathematics	
		Regular (N=26)	Remedial (N=26)	Regular (N=25)	Remedial (N=25)
Classroom teachers	Mean	39	n/a	56	n/a
	Median	39	-	50	-
	S.D.	11	-	35	-
	Range	19-60	-	0-199	-
Remedial specialists	Mean	5	48	2	42
	Median	2	56	0	47
	S.D.	7	35	4	41
	Range	0-28	0-98	0-15	0-142
Instructional aides	Mean	2	18	3	11
	Median	0	0	0	0
	S.D.	3	23	7	24
	Range	0-10	0-65	0-26	0-96
Speech therapists	Mean	1	3	n/a	n/a
	Median	0	0	-	-
	S.D.	1	10	-	-
	Range	0-4	0-45	-	-
Counselors	Mean	2	5	1	2
	Median	1	0	1	0
	S.D.	1	8	1	5
	Range	0-5	0-24	0-5	0-20
Media specialists	Mean	3	3	1	0
	Median	2	0	0	0
	S.D.	3	7	1	1
	Range	0-13	0-26	0-2	0-2
Total*	Mean	52	74	62	55
	Median	49	78	55	52
	S.D.	16	59	34	62
	Range	27-93	0-168	0-199	0-242

n/a: not applicable

*Column entries may not sum to the "total," because of roundings.

TABLE V-32. TEACHER PERCEPTION OF DECISION-MAKING ROLE: BASIC SECONDARY SAMPLE*

Decision Area	Teacher Participation (N=1049)
Material selection	52.6
Student class assignment	22.1
Grading procedures	65.9
Co-curricular activities	53.2
Inservice requirements	32.0
Teacher class assignment	32.8
Setting school goals	36.3
Planning course content	71.3

*Cell entries represent the percentage of responding teachers selecting each category.

TABLE V-33. INVOLVEMENT IN COMPENSATORY PROGRAM: BASIC SECONDARY SAMPLE*

Persons Involved	Needs Assessment		Planning and Development		Evaluation	
	Reading (N=256)	Math (N=162)	Reading (N=256)	Math (N=162)	Reading (N=256)	Math (N=162)
District personnel	35.9	39.6	57.8	44.5	43.0	35.4
Principal and administrative staff	35.5	37.2	48.8	38.4	42.6	42.7
Remedial teachers	39.5	26.8	60.5	39.0	39.1	33.5
Regular teachers	41.0	33.5	60.2	57.9	41.8	34.8
Parents	20.7	20.4	6.3	6.2	3.9	4.9
Students	22.7	19.1	9.4	5.6	8.2	5.6

*Cell entries represent the percentage of responding teachers selecting each category.

(1) Class Size

As shown in Tables V-34 and V-20, classes in the Pilot sample tended to be larger than those in the Basic Elementary sample. Within the Pilot sample, regular classes in the treatment schools were generally larger than those in control schools. For example, over 40 percent of the regular classes in treatment schools exceeded 30 students, in contrast with about 20 percent in control schools.

TABLE V-34. CLASS SIZE: PILOT ELEMENTARY SAMPLE*

Type of Class	Number of Students	Regular		Remedial	
		Treatment	Control	Treatment	Control
Reading		(N=78)	(N=109)	(N=11)	(N=13)
	10 or fewer	7.8	7.3	9.1	23.1
	11 to 20	12.8	10.1	72.7	30.8
	21 to 30	37.2	61.5	9.1	15.4
	More than 30	42.3**	21.1	9.1	30.8
	Average	26.6	25.4	16.6	21.1
Mathematics		(N=88)	(N=106)	(N=7)	(N=4)
	10 or fewer	3.4	1.9	14.3	0.0
	11 to 20	6.8	4.8	42.9	75.0
	21 to 30	48.9	72.6	14.3	25.0
	More than 30	40.9**	20.8	28.6	0.0
	Average	27.7	27.0	19.4	16.7

*Cell entries represent the percentage of responding teachers in each category.

**A statistically significant treatment-control difference ($p \leq .05$) is present.

(2) Student Time in Instructional Activities

Students in regular classrooms spent about two hours a day in reading activities and about 45 minutes in math activities (Table V-35); this pattern was similar to that of the Basic Elementary students (Table V-21). However, Pilot students in remedial classes spent about twice as much time in math activities (104 minutes daily) as did their Basic counterparts (48 minutes); the largest contributor to this difference was the time students spent in small groups with math specialists.

TABLE V-35. STUDENT TIME IN INSTRUCTIONAL ACTIVITIES: PILOT ELEMENTARY SAMPLE*

Instructional Activity	Minutes Per Day			
	Reading		Mathematics	
	Regular (N=201)	Remedial (N=32)	Regular (N=210)	Remedial (N=12)
Teacher and whole class	18.3	9.1	8.7	8.3
Teacher and small group	20.6	17.8	6.0	9.2
Teacher and individual student	9.1	8.6	2.8	6.5
Specialist and small group	12.0	22.6	3.5	20.5
Aide and small group	6.2	13.9	2.1	12.6
Adult tutor	2.1	3.1	0.6	2.3
Student tutor	4.1	4.0	0.9	0.5
Independent: programmed texts, etc.	12.9	12.4	3.9	12.0
Independent: dittos, workbooks	19.9	15.3	9.5	12.5
Independent: learning centers	11.1	9.1	2.3	5.3
Testing and evaluation	11.4	12.1	4.1	9.9
Total**	124.1	138.0	44.7	103.6

*Cell entries represent the average number of minutes per day spent by the typical student in each classroom activity, as reported by teachers.

**Total time in activities was computed only for teachers who provided data for all activity categories; therefore, this total does not necessarily equal the sum of the individual category means.

(3) Teachers' Special Training

As shown in Table V-36, 57 percent of the remedial math teachers had not participated in inservice training during the current year, but over 90 percent of this group had received non-inservice special training within the last five years. As in the other samples, the broadest inservice participation was among the remedial reading teachers.

TABLE V-36. TEACHERS' SPECIAL TRAINING IN READING AND MATHEMATICS: PILOT ELEMENTARY SAMPLE*

Type of Training	Extent of Participation	Reading Teachers		Mathematics Teachers	
		Regular	Remedial	Regular	Remedial
Non-Inservice		(N=179)	(N=34)	(N=172)	(N=14)
	Within 1 year	25.7	47.1	17.4	21.4
	1 to 4 years	44.1	41.2	41.9	71.4
	5 or more years	15.6	8.8	18.6	0.0
	No training	14.5	2.9	22.1	7.1
Inservice		(N=181)	(N=36)	(N=181)	(N=14)
	No training	45.9	19.4	49.2	57.1
	10 or fewer hours	35.4	38.9	39.2	28.6
	11 to 20 hours	11.0	25.0	8.8	0.0
	More than 20 hours	7.7	16.7	2.8	14.3
	Average number of hours:				
	All teachers	6.0	11.1	4.3	5.9
	Participating teachers	11.1	13.8	8.4	13.8

*Cell entries represent the percentage of responding reachers in each category.

**"Extent of Participation" is defined as recency for non-inservice training; for inservice training, "Extent of Participation" is the number of hours in the current school year.

(4) Personnel Instructional Time

As in the Basic Elementary sample, regular classroom teachers provided about five hours of reading instruction and four hours of math instruction weekly (see Table V-37). Treatment teachers received 1.6 hours of assistance in reading and 1.0 hours of assistance in math from instructional aides (about double the amount received by control teachers). Within the remedial classrooms, specialists provided almost four hours per week of reading instruction, and about three hours in math instruction. Almost four hours of instructional assistance in math was provided each week by paid aides. Aides also assisted for about four hours in reading instruction in the control schools, but for only two hours in the treatment schools (difference significant at the .05 probability level).

(5) Personnel Allocation Cost Index

In the Pilot sample, regular reading was the only area in which the total per-pupil cost allocation was greater (though not significantly so) in the treatment schools than in the control schools. As Table V-38 shows, this relatively small overall difference was accounted for primarily by the treatment schools' significantly larger (.05 level) allocation to instructional aides. There appears to be great variability in the total allocations (and some of the components) for the remedial classes. In both treatment and control schools, medians are considerably lower than the means, suggesting that a small number of schools had unusually large cost allocations.

Total personnel resource cost allocations were generally smaller in the Pilot sample than in the Basic Elementary sample, particularly in the treatment schools. The greatest difference between the samples was found in the remedial reading area, where Pilot treatment schools' cost allocations ($60) were about half those in Basic Elementary schools ($118); this contrasts with the control schools, in which the Pilot costs were slightly higher than the Basic Elementary costs ($107 and $94, respectively).

TABLE V-37. PERSONNEL INSTRUCTIONAL TIME: PILOT ELEMENTARY SAMPLE

Type of Class	Personnel Category	Hours per Week			
		Regular		Remedial	
		Treatment	Control	Treatment	Control
Reading		(N=80)	(N=107)	(N=11)	(N=12)
	Classroom teacher	5.5	5.2	n/a	n/a
	Remedial teacher or specialist	1.4	1.2	3.5	3.8
	Speech therapist	0.4	0.3	0.3	0.4
	Counselor or psychologist	0.0	0.0	0.3	0.1
	Media specialist	0.1	0.1	0.5	0.2
	Paid paraprofessional or aide	1.6*	0.6	1.9	4.0*
	Student teacher	0.1	0.2	0.0	0.0
	Parent or adult volunteer	0.1	0.1	0.1	0.1
	Student tutor	0.2	0.4	0.2	0.2
Mathematics		(N=87)	(N=109)	(N=7)	(N=4)
	Classroom teacher	3.8	3.8	n/a	n/a
	Remedial teacher or specialist	0.5	0.5	2.4	3.0
	Counselor or psychologist	0.1	0.0	0.1	0.3
	Media specialist	0.1	0.0	0.0	0.0
	Paid paraprofessional or aide	1.0*	0.5	3.9	3.7
	Student teacher	0.1	0.2	0.3	0.0
	Parent or adult volunteer	0.1	0.0	0.1	0.0
	Student tutor	0.2	0.4	0.5	2.0

n/a: not applicable

*The difference between the means of the treatment and control groups was significant at the .05 probability level.

TABLE V-38. ANNUAL PER-PUPIL PERSONNEL COST ESTIMATES (DOLLARS): PILOT ELEMENTARY SAMPLE

Personnel Category		Reading				Mathematics			
		Regular		Remedial		Regular		Remedial	
		Treatment (N=10)	Control (N=10)	Treatment (N=10)	Control (N=10)	Treatment (N=10)	Control (N=10)	Treatment (N=10)	Control (N=10)
Classroom teachers	**Mean**	68	69	n/a	n/a	40	49	n/a	n/a
	Median	68	63	-	-	41	40	-	-
	S.D.	15	12	-	-	18	31	-	-
	Range	92-45	87-51	-	-	73-0	124-0	-	-
Remedial specialists	**Mean**	16	20	31	61	11	9	24	25
	Median	12	18	39	46	7	0	23	4
	S.D.	9	19	33	86	15	13	24	34
	Range	31-8	67-0	93-0	282-0	40-0	36-0	66-0	101-0
Instructional aides	**Mean**	10*	2	14	38	7	2	18	18
	Median	6	0	0	31	1	1	3	1
	S.D.	9	3	17	56	10	3	24	28
	Range	27-0	8-0	38-0	190-0	27-0	9-0	63-0	64-0
Speech therapists	**Mean**	4	3	11	6	n/a	n/a	n/a	n/a
	Median	2	3	4	0	-	-	-	-
	S.D.	5	3	24	10	-	-	-	-
	Range	12-0	9-0	72-0	25-0	-	-	-	-
Counselors	**Mean**	1	1	4	2	0	0	2	4
	Median	0	0	0	1	0	0	1	0
	S.D.	1	1	6	5	0	0	5	6
	Range	3-0	2-0	14-0	14-0	1-0	1-0	17-0	14-0
Media specialists	**Mean**	5	1	5	6	0	0	0	0
	Median	3	0	1	1	0	0	0	0
	S.D.	6	2	12	14	1	1	0	0
	Range	19-0	5-0	36-0	44-0	2-0	2-0	0	0
Total**	**Mean**	103	97	60	107	59	61	44	47
	Median	96	94	19	78	53	56	35	2
	S.D.	17	27	62	150	32	34	46	66
	Range	137-81	157-62	148-0	517-0	113-0	124-0	129-0	175-0

n/a: not applicable

*The difference between the means of the treatment and control groups is significant at the .05 probability level.

**Column entries may not sum to the "total," because of roundings.

(6) Staff Decision-Making and Community Involvement

Control teachers reported greater participation in all decision-making areas than did teachers in the treatment schools (Table V-39), with the greatest differences in the selection of instructional materials and the setting of school goals.

TABLE V-39. TEACHER PERCEPTION OF DECISION-MAKING ROLE: PILOT ELEMENTARY SAMPLE*

Decision-Making Area	Teacher Participation	
	Treatment (N=117)	Control (N=135)
Material selection	34.5	47.4**
Student class assignment	25.2	35.6
Grading procedures	49.6	61.4
Co-curricular activities	43.6	48.8
Inservice requirements	21.4	26.6
Teacher class assignments	23.1	32.8
Setting school goals	31.9	51.5**
Planning course content	48.7	57.6

*Cell entries represent the percentage of responding teachers selecting each category.

**A statistically significant treatment-control difference ($p \leq .05$) is present.

Teachers in treatment schools reported greater involvement by district personnel in the compensatory programs than did their control counterparts (see Table V-40). These differences were statistically significant in four of the six areas of involvement. As in the other samples, district involvement was greatest in compensatory program planning and development, and parent and student involvement was greatest in the area of needs assessment.

Table V-40. INVOLVEMENT IN COMPENSATORY PROGRAM: PILOT ELEMENTARY SAMPLE*

Program Area	Persons Involved	Reading		Mathematics	
		Treatment (N=96)	Control (N=110)	Treatment (N=90)	Control (N=103)
Needs Assessment	District personnel	38.5	26.4	38.2**	23.5
	Principal & adm. staff	38.5	28.2	39.3	33.0
	Remedial teachers	30.2	30.0	30.0**	16.5
	Regular teachers	36.5	36.4	38.2	30.1
	Parents	15.6	19.1	18.9	20.4
	Students	17.7	18.2	22.2	17.5
Planning and Development	District personnel	62.5**	47.3	56.2**	41.2
	Principal & adm. staff	56.3	50.0	42.2	42.7
	Remedial teachers	52.1	43.6	44.9**	22.3
	Regular teachers	49.0	46.4	52.8	53.4
	Parents	9.4	2.7	7.8	4.9
	Students	10.4	5.5	7.8	6.8
Evaluation	District personnel	50.0**	34.5	42.2	34.3
	Principal & adm. staff	46.9	40.0	38.2	38.8
	Remedial teachers	30.2	28.2	22.2	16.5
	Regular teachers	27.1	29.1	24.7	32.0
	Parents	8.3	3.6	6.7	6.8
	Students	9.4	2.7	7.8	5.8

*Cell entries represent the percentage of responding teachers selecting each category.

**A statistically significant treatment-control difference ($p \leq .05$) is present.

d. Relationship of Services to Needs

As in the first two years of this study, an assessment was made of whether academic services in sample schools were directed toward the students who needed those services. Unlike the first two years of the study, this year's assessment included data from control (non-ESAA-funded) schools as well as from treatment (ESAA-funded) schools. Our assumption, which was tested by this analysis, was that treatment schools were more likely than control schools to target certain resources (presumably bought, at least in part, with ESAA funds) to especially needy students.

(1) Operational Definitions

Academic need was defined by pretest achievement scores in total reading and total math. The average of student achievement scores within the school was used in this analysis. A low score represented a high level of need in the school.

Extent of resource use was defined in terms of teacher questionnaire data on reading and math program characteristics. For each class in the ESAA sample, an average per-student hourly allocation was calculated for each type of staff resource used to provide reading or math instruction in the class. These individual class resource allocation estimates were aggregated to obtain school-level estimates (for a more detailed description, see Appendix V-F).

(2) Method

Pearson correlation coefficients were computed between each pretest variable (inversely related to need) and its corresponding set of resource use variables (services). Appropriateness of services provided was assumed to be indicated by the magnitude and direction of the correlation coefficient. Since a low pretest score corresponds to a high level of need, a strong negative correlation would indicate that resources were targeted to students who showed the greatest need. All correlation coefficients were computed at the school level, separately for each sample.

(3) Results

(a) Basic Elementary Sample. Table V-41 presents Pearson correlation coefficients between the reading and math pretest scores, and estimates of the extent to which various staff resources were used in reading and math. In general, treatment schools appear to have provided greater resources to the more needy students than to the less needy students. This was especially the case for math instruction; two of the component coefficients were statistically significant (at the .05 level), and the relationship between total level of resource use and pretest scores was also significant at the .05 level. The correlations between reading resources and reading pretest scores, though non-significant, reflect the same tendency for the more needy schools to have higher levels of resource use than the less needy schools.

By contrast, Basic Elementary control schools failed to show any significant relationship between academic need and level of resource use. A number of negative correlations suggest a slight tendency for the needier schools to have higher allocations of certain resources than did the less needy schools. However, there was no consistent pattern, and some of the correlations are in the positive direction. Thus, overall, results from the Basic Elementary sample appear consistent with the assumption that treatment schools, with their ESAA funds, were more likely than control schools to target higher levels of resource use to especially needy students.

(b) Basic Secondary Sample. In this sample, treatment schools targeted slightly larger amounts of resources to the needier students in reading and math. A majority of the correlation coefficients were in the negative direction, although none were statistically significant. Among control schools, the tendencies were somewhat mixed between reading and math. On the one hand, Basic Secondary control schools tended to show higher levels of resource use for students having the greatest reading deficiencies. As the data in Table V-41 indicate, most of the coefficients were negative, with one (instructional aides

TABLE V-41. PEARSON CORRELATION COEFFICIENTS BETWEEN ACHIEVEMENT PRETEST SCORES AND LEVEL OF RESOURCE USE

Combined Regular and Remedial Resources	Basic Elementary Sample				Basic Secondary Sample				Pilot Elementary Sample			
	Treatment (N=18)		Control (N=18)		Treatment (N=13)		Control (N=13)		Treatment (N=10)		Control (N=10)	
	Reading Pretest	Math Pretest	Reading Pretest	Math Pretest	Reading Pretest	Math Pretest	Reading Pretest	Math Pretest	Reading Pretest	Math Pretest	Reading Pretest	Math Pretest
Classroom teachers	.11	-.27	.10	.03	-.45	-.17	.49*	.40	-.13	.71*	.13	.47
Remedial specialists	.01	-.29	.22	-.10	-.08	-.13	-.16	.00	.29	.05	-.02	.08
Instructional aides	-.17	-.44*	-.10	.05	-.22	.22	-.60*	.16	.11	.33	.03	.33
Speech therapists	-.21	n/a	-.23	n/a	-.03	n/a	-.43	n/a	.03	n/a	.02	n/a
Counselors	.30	-.64*	.28	-.20	.28	.02	-.11	.33	-.55*	.24	.19	.39
Media specialists	-.14	-.34	-.04	-.15	.05	-.33	.12	.25	-.18	.17	.08	.18
Total	-.12	-.40*	.14	-.03	-.25	-.12	-.12	.37	.04	.37	.03	.31

n/a: not applicable

*The correlation coefficient was statistically significant at the .05 probability level.

in reading) significant at the .05 level. On the other hand, schools whose students had the smallest math deficiencies tended to allocate larger amounts of resources to math instruction than did schools with the greatest math deficiencies.

(c) Pilot Elementary Sample. As the data in Table V-41 illustrate, no clear-cut pattern emerged from the Pilot Elementary sample analyses. Only two of fourteen correlation coefficients for the treatment schools were statistically significant at the .05 level, with one of the coefficients being positive (classroom teachers in math) and the other negative (counselors in reading). Overall, treatment schools did not target higher levels of resource use to especially needy students in reading or math.

Pilot control schools with less needy students tended to allocate larger amounts of resources to reading and math instruction. All but one of the correlation coefficients for control schools were in the positive direction; however, none of the coefficients were statistically significant.

(4) Summary

Only the Basic Elementary sample showed fairly clear-cut treatment-control differences in the targeting of academic resources to students with particularly acute academic needs; for that sample, targeting appears to have been superior in the schools with ESAA funding. For the other two evaluation samples, the patterns of relationships between resources and academic needs are much more difficult to interpret, though there is still some slight evidence of better targeting of resources in the treatment schools.

2. DESEGREGATION ACTIVITIES

The following paragraphs describe activities related to the physical desegregation of schools; such activities include desegregation plans, student bussing, and communication efforts in the Basic Elementary and Secondary schools. (Pilot schools, which by definition are minority-isolated, are not included in these descriptions.) Information was derived from the principal questionnaire; thus, responses represent the principals' perceptions of school conditions. Because treatment-control differences were not statistically significant, data are presented for the combined sample.

a. Basic Elememtary Sample

Elements of the district desegregation plans that affected the schools are shown in Table V-42. Almost 70 percent of the schools had plans that included the drawing of new school boundaries, 37 percent included the bussing of students from other areas, and 26 percent included the closing or conversion of schools. Other alternatives were used infrequently. Only 14 percent of the schools for which the principal felt the question was applicable had a contingency plan in case of racial or ethnic difficulty.

Table V-43 shows the principals' estimates of the percentages of students bussed to or away from the school to achieve racial or ethnic balance. Of those schools for which the principal felt the question was applicable, 72.7 percent of the schools had students bussed in to achieve racial or ethnic balance, and 40 percent had students bussed out to other schools for this purpose.

Most communication efforts related to desegregation were informal (see Table V-44). Of those principals who felt the questions were applicable, 27 percent reported meetings between the district and community or parent groups for the purpose of informing these groups about desegregation plans or processes. About 15 percent reported receiving from the district superintendent memoranda suggesting guidelines to facilitate desegregation. There were no formal faculty meetings to discuss methods of facilitating desegregation, but 82 percent of the principals who were present in the school at the time of desegregation reported talking with the teachers about ways to handle students of a different race.

TABLE V-42. PERCENTAGES OF BASIC SCHOOLS WITH VARIOUS DESEGREGATION PLAN ELEMENTS

Plan Elements	Basic Elementary (N=39)	Basic Secondary (N=23)
Elements Affecting School:*		
Redrawing school boundaries	69.2	47.8
Bussing students from other areas	36.9	34.8
Closing schools or converting to vocational or special schools	25.6	8.7
Establishing schools with limited grade span	17.9	4.3
Creating non-contiguous attendance areas	15.4	17.4
Pairing schools	5.1	4.3
Question not applicable	17.9	26.1
Contingency Plan:		
Plan developed	10.3	36.4
Plan not developed	64.1	36.4
Question not applicable	25.6	27.3

*Multiple plan elements are possible; therefore, percentages do not total 100 percent.

TABLE V-43. PRINCIPAL ESTIMATES OF PERCENTAGE OF STUDENTS BUSSED IN OR OUT TO ACHIEVE RACIAL/ETHNIC BALANCE*

Bussing Category	Basic Elementary		Basic Secondary	
	Bussed In (N=22)	Bussed Out (N=21)	Bussed In (N=12)	Bussed Out (N=14)
No students bussed	27.3	60.0	33.3	71.4
Students bussed	72.7	40.0	66.7	28.6
In schools with students bussed:				
Median percentage of students bussed	20.0	20.0	8.0	11.0
Range of percentages of students bussed	6-80	3-49	4-17	3-40

*Cell entries are based upon those schools for which the principal said the questions were applicable.

TABLE V-44. COMMUNICATION EFFORTS RELATED TO DESEGREGATION*

Type of Communication	Response	Basic Elementary	Basic Secondary
District-Community Meetings		(N=39)	(N=23)
	Question not applicable	61.5	60.9
	Meetings took place	10.3	13.0
	(Average number of meetings)	(6.5)	(9.0)
	Applicable, no meetings	28.2	26.1
Superintendent Memoranda to Principal		(N=35)	(N=20)
	Question not applicable	5.7	35.0
	Received memoranda	14.3	15.0
	Applicable, no memoranda	80.0	50.0
Formal Faculty Meetings		(N=35)	(N=20)
	Question not applicable	5.7	30.0
	Meetings held	0.0	5.0
	Applicable, no meetings held	94.3	65.0
Principal-Teacher Communication		(N=33)	(N=20)
	Question not applicable	15.2	30.0
	Talked with teachers formally or informally	27.3	30.0
	Applicable, no communication	6.1	0.0
	Not principal at time of desegregation	51.5	40.0

*Cell entries represent the percentage of responding principals in each category.

b. Basic Secondary Sample

About 48 percent of the schools were affected by the drawing of new school boundaries, and 35 percent were affected by the bussing of students from other areas (see Table V-42). Other alternatives were used infrequently. Half the schools for which the principal felt the question was applicable had a contingency plan in case of racial or ethnic difficulty. Table V-43 shows the principals' estimates of the percentage of students bussed to and away from the school to achieve racial or ethnic balance. Of those schools for which the principal felt the question was applicable, 66.7 percent had students bussed in, and 28.6 percent had students bussed out.

As shown in Table V-44, about one-third of those principals who felt the question was applicable reported meetings between district personnel and community or parent groups for the purpose of informing these groups about desegregation plans or processes; 23 percent reported having received memoranda from the district superintendent. One principal held a special faculty meeting, and all the principals who were at the school at the time of desegregation reported speaking with the teachers.

3. INTERCULTURAL/INTERGROUP RELATIONS PROGRAMS

One of the objectives of the ESAA Basic programs was the promotion of interracial interaction and cultural activities to facilitate the desegregation process in districts receiving program grants. This subsection examines teacher questionnaire items dealing with student and staff participation in intercultural heritage/intergroup relations programs (sometimes referred to as cultural enrichment programs). Estimates of student exposure to intercultural discussions and bilingual activities are also presented; these estimates were derived from the Student Attendance and Exposure Log (SAL).* Results are reported for the

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*For one week out of each month, the secondary student or elementary teacher indicated on the SAL the student's participation in various activities.

Basic Elementary and Secondary samples; Pilot schools are not discussed, since their programs were for the most part limited to basic skills instruction.

a. Basic Elementary Sample

(1) Staff Participation

Data on teachers' special (non-inservice) training and inservice training in cultural enrichment/intergroup relations are presented in Table V-45. Almost half the teachers never had special training, and about two-thirds had no inservice training within the current school year. Those teachers who did participate in inservice training received, on the average, about eight hours of training. Overall, the training of treatment school teachers tended to be more recent than that of control school teachers. For example, 44 percent of treatment school teachers, compared with 38 percent of control school teachers, had received training within the last four years.

An interesting finding for both the treatment and control elementary schools is shown in Table V-46. There was a statistically significant relationship between the teachers' attitudes regarding the effects of desegregation within the school, and the participation of those teachers in special (non-inservice) training in cultural enrichment/intergroup relations within the previous four years. Almost twice as many teachers with such training felt there were many positive effects of desegregation as did teachers with less recent or no training.

Because treatment-control differences were statistically nonsignificant for teacher estimates of staff participation in cultural enrichment/intergroup relations activities, data are presented here for the combined sample (see Table V-47). Teachers reported spending an average of 1.5 hours of classroom time per week on intercultural activities in which the students participated. Almost three-fourths of the teachers used some classroom time for these activities, but only about half reported any time spent by other teachers or administrators on intercultural/intergroup activities in which students participated.

TABLE V-45. CULTURAL ENRICHMENT/INTERGROUP RELATIONS TRAINING*

Training	Basic Elementary		Basic Secondary	
	Treatment	Control	Treatment	Control
Recency of Special Training (Non-Inservice):	(N=215)	(N=189)	(N=440)	(N=477)
Within 1 year	14.4	17.5	14.5	13.0
1 to 4 years	29.3	20.1	23.9	19.5
5 or more years	8.4	18.5	5.7	7.3
No training	47.9	43.9	55.9	60.2
X^2, 3df	12.23**		4.09	
Hours Inservice Training Within Current Year:	(N-234)	(N=206)	(N=465)	(N=499)
No training	61.1	65.0	65.4	66.5
10 or fewer hours	33.3	28.2	26.2	26.1
11 to 20 hours	3.4	3.9	6.0	4.4
More than 20 hours	2.2	2.9	2.3	3.0
Average number of hours (for participants)	7.7	8.6	8.7	9.0
X^2, 4df	1.60		4.86	

*Cell entries represent the percentage of responding teachers in each category.

**The difference between the distribution of teachers in the treatment and control schools was statistically significant at the .01 probability level.

TABLE V-46. TEACHER PERCEPTION OF EFFECTS OF DESEGREGATION UPON SCHOOL

Type of Training	Basic Elementary						Basic Secondary					
	Treatment			Control			Treatment			Control		
	Number of Teachers	Very Positive (Per-cent)	Less Positive (Per-cent)	Number of Teachers	Very Positive (Per-cent)	Less Positive (Per-cent)	Number of Teachers	Very Positive (Per-cent)	Less Positive (Per-cent)	Number of Teachers	Very Positive (Per-cent)	Less Positive (Per-cent)
Special Training (Non-Inservice):												
Recent*	72	44.4	55.6	56	53.6	46.4	112	28.6	71.4	104	28.8	71.2
Not recent	97	24.7	75.3	93	30.1	69.9	202	23.3	76.7	229	22.3	77.7
x^2, 1df	7.16**			8.09**			1.08			1.62		
Inservice Training:												
No training	113	28.3	71.7	110	37.3	62.7	229	19.7	80.3	236	21.2	78.8
Some training	75	40.0	60.0	55	38.2	61.8	106	33.0	67.0	116	30.2	69.8
x^2, 1df	2.82			.01			7.14**			3.43		

*"Recent" training was received within the preceding four years; "not recent" indicates that no special training was received, or that it occurred five or more years ago.

**The difference in the positiveness of perception between teachers with the specified training was significant at the .01 probability level.

TABLE V-47. STAFF PARTICIPATION IN STUDENT CULTURAL ENRICHMENT/INTERGROUP RELATIONS ACTIVITIES

Amount of Participation in Intercultural Activities	Basic Elementary (N=398)	Basic Secondary (N=894)
Classroom time spent by teacher:		
Percentage reporting some time	72.6	51.3
Average number of hours per week	1.5	1.1
Time in needs assessment, program planning, and evaluation:		
Percentage reporting some time	71.8	59.4
Average number of hours during this school year	4.0	3.6
Time in curriculum development:		
Percentage reporting some time	57.8	60.9
Average number of hours during this school year	3.2	3.7
Percentage of teachers reporting participation in student activities by:		
Principal and administrative staff	46.3	71.9
Teacher (other than self)	56.7	80.6
Paid instructional aide	24.1	35.5
District coordinator	18.9	39.2

Almost three-fourths of the teachers reported devoting some time during the current year to program planning and evaluation, and over half reported time spent in curriculum development.

(2) Student Participation

About three-fourths of the teachers (Table V-48) reported some student participation in cultural heritage/intergroup relations programs, and almost half the students participated for about four hours per month. Estimates from the Student Attendance and Exposure Log indicate that about 70 percent of the students participated in instruction or discussion about minority groups, and about 10 percent participated in bilingual activities. Discussions based on films, reading materials, or tapes occurred with the greatest frequency, followed by intercultural presentations such as plays, concerts, and prose or poetry readings; informational presentations, such as assemblies and adult speakers in classrooms; and visits to places of special interest.

b. Basic Secondary Sample

(1) Staff Participation

Over half the teachers never had cultural enrichment/intergroup relations non-inservice special training; about one-third had training within the previous five years (see Table V-45). Two-thirds of the teachers reported receiving no inservice training; those who did participate received about nine hours of training.

Treatment school teachers with recent inservice training in cultural enrichment/intergroup relations perceived the effects of desegregation within the school as significantly more positive than did those without inservice during the current year (Table V-46). The relationship in the control schools was in the same direction, but was not statistically significant.

TABLE V-48. STUDENT PARTICIPATION IN CULTURAL ENRICHMENT/INTERGROUP RELATIONS ACTIVITIES

Source of Data	Amount of Participation	Basic Elementary	Basic Secondary
Teacher Questionnaire		(N=403)	(N=907)
	Percentage of teachers reporting student participation	74.2	75.6
	Percentage of students participating	44.8	17.8
	Average number of hours per month (for participating students)	4.2	3.2
	Average number of times per year in following activities:		
	Discussion of films, reading material, etc.	3.0	2.1
	Informational presentations	1.7	2.0
	Intercultural presentations, such as plays	1.8	1.4
	Visits to places of special interest	1.2	1.3
	Interchanges with students from other schools	0.4	1.1
Student Attendance and Exposure Log		(N=5599)	(N=2946)
	Percentage of students participating in instruction or discussion about minority groups	71.3	54.3
	Percentage of students participating in bilingual activities	9.5	20.0

*Estimates were derived from the Student Attendance and Exposure Logs for each sample student and represent the percentage of students in each category.

Table V-47 provides teacher estimates of staff participation in activities relating to cultural enrichment/intergroup relations. Teachers reported spending about one hour per week on intercultural activities in which the students participated. About half the teachers reported spending some classroom time on these activities, 80 percent reported participation by other teachers in student activities, and 72 percent reported principal participation. About 60 percent of the teachers reported spending time during the current year on curriculum development and program planning and evaluation.

(2) Student Participation

Table V-40 provides teacher estimates of student participation in cultural heritage/intergroup relations programs. About three-fourths of the teachers reported some student participation in such programs. Approximately 18 percent of the students were estimated to participate about three hours per month. Student-reported data indicated participation in instruction or discussion about minority groups by about half the students; about 20 percent reported participation in bilingual activities. Discussion of audio-visual and informational presentations were the most frequently reported activities, followed by intercultural presentations and visits to places of special interest.

c. Program Composite Variables

Program composites were developed through the use of factor analysis. Appendix V-G presents the factor structure. There were three distinct factors at the elementary level. Participation (P) is a measure derived from teacher estimates of student participation in intercultural heritage/intergroup relations programs, and of their own participation in classroom activities, program planning, and curriculum development in these desegregation-related areas. Student activities (S) is a composite of the frequency of student participation in various types of intercultural activities. Continuing education (C) is a combination of the recency of special training, and of the hours of inservice training within the current school year.

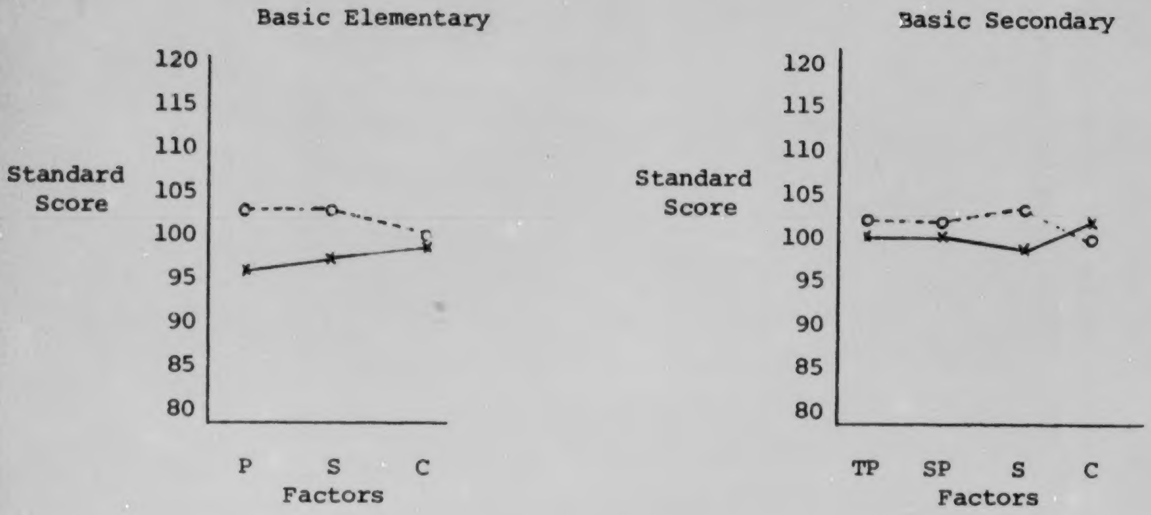
At the secondary level, there were two participation factors, one for student participation in intercultural programs and one for teacher participation in classroom activities, program planning and evaluation, and curriculum development. The other factors, student activities and teachers' continuing education, were the same at both levels.

Elementary control schools were higher than treatment schools in all the composites (see Figure V-1). That is, control schools reported more active participation than did treatment schools in the various desegregation-related and cultural enrichment activities represented by the composites. Control schools also had higher composite values at the secondary level, except in teachers' continuing education. However, none of the treatment-control differences were statistically significant.

4. SUMMARY OF RESULTS: SERVICES

Major findings about the educational services provided to sample students are:

- About 20 percent of the teachers reported parent and student participation in school-related needs assessment activities; however, these groups participated only infrequently in program planning, development, or evaluation.
- Over 80 percent of the remedial reading teachers in each sample participated in inservice training programs. This finding contrasts with that for the remedial math teachers: participation by about half in the Pilot Elementary and Basic Secondary samples, and by 75 percent in the Basic Elementary sample. Half the regular classroom teachers in both reading and mathematics participated in inservice training programs.
- Most regular classes had from 21 to 30 students, and remedial classes generally had from 11 to 20 students. The lowest student-teacher ratios were found in the Basic Elementary sample, where the percentage of classes with more than 30 students was only half that in the Pilot Elementary sample.



X = Treatment
O = Control

P = Participation
S = Student activities
C = Continuing education
TP = Teacher participation
SP = Student participation

Figure V-1. Treatment-Control Profiles of Intercultural Programs

- Among the remedial teachers in all samples, paid paraprofessionals or teacher aides were the most frequently used auxiliary personnel. Remedial reading teachers at both the elementary and secondary levels, and remedial mathematics teachers in the Pilot sample, received about three hours of assistance weekly, while remedial mathematics teachers in the Basic samples received only about one hour of help weekly.
- Elementary students spent about two hours per day in reading activities; secondary students in regular classes averaged about one hour per day in reading (English) activities, and those in remedial classes averaged about two hours. Approximately one hour per day was spent in mathematics instruction. An average of about ten minutes per day was used for testing and evaluation in the reading classes, and about five minutes daily in the mathematics classes.
- Redrawing of school boundaries and bussing of students were the most common elements of district desegregation plans affecting sample schools.
- About one-third of the Basic sample teachers received training in cultural enrichment/intergroup relations. At the secondary level, more positive teacher perceptions of the effects of desegregation were found in schools where teachers had such inservice training.
- Approximately half of the secondary students and three-fourths of the elementary students participated in cultural enrichment/intergroup relations activities.
- About 10 percent of the elementary students and 20 percent of the secondary students participated in "English as a Second Language" activities.

As noted in Section A of this chapter, total per-pupil expenditures in treatment schools were generally higher than those in control schools (presumably reflecting the assignment of ESAA funds to treatment schools), but these differences in expenditures were statistically significant only for the Basic Elementary sample. Similarly, only the Basic Elementary sample showed significantly higher per-pupil supplemental allocations in the treatment schools for basic skills instruction and for human relations activities. Thus, it would appear reasonable to expect that the Basic Elementary sample would also show the most clear-cut treatment-control differences in resources and services provided to students. In an effort to determine how treatment-control funding differences might have been translated into differences in services, treatment-control comparisons were made of all the program characteristics discussed in this section or presented in Appendix V-E. Statistically significant results (at the .05 probability level) occurred infrequently; of all the comparisons made over the three samples, about five percent were significant--approximately the number expected by chance. Most of the differences were at the elementary level, with the characteristics of the Basic Elementary reading programs in the treatment schools most consistently reflecting that group's funding advantage over the control schools. The major interpretable treatment-control differences were:

- In the Basic Elementary sample, regular (non-remedial) classrooms in treatment schools tended to have smaller numbers of students than those in the control schools; this relationship was reversed in the Pilot sample.

- Personnel allocations in the Basic Elementary sample indicated greater use in treatment schools than in control schools of auxiliary personnel for the regular reading programs. Remedial specialists, instructional aides, and media specialists were all used to a significantly greater extent in treatment schools. The Pilot treatment schools also made significantly greater use of instructional aides, but not of the other auxiliary personnel categories.

- In both the Basic and Pilot Elementary samples, control-school teachers saw themselves as more actively involved in various types of school decision-making than did the treatment-school teachers.

- District involvement in the compensatory programs of the Pilot Elementary sample was reported more frequently by teachers in treatment schools than by their control counterparts.

(Last page this chapter)

CHAPTER VI

PROGRAM IMPACT

Analysis-of-variance of the Year Three cross-sectional samples indicated positive ESAA program impact (i.e., significant treatment-control outcome differences favoring treatment schools) on basic achievement for the Basic Elementary sample, but not for the Basic Secondary or Pilot Elementary sample. These results are consistent with the fact that only the Basic Elementary sample showed clear-cut treatment-control differences, favoring treatment schools, in school expenditures and resource allocations. The finding of significant program impact for the Basic Elementary sample in Year Three, when significance had not been reached in Year One or Two, is probably attributable to increased program maturation; in addition, the treatment schools' advantage over control schools in total per-pupil expenditures had increased slightly each year. Analyses of the three-year longitudinal samples (students who had been in the study for all three years) indicated strong linear trends in the achievement data but failed to show evidence of cumulative program impact.

In this third and final year of the ESAA evaluation, two approaches were taken to the analysis of ESAA program impact. The first approach, essentially the same as that used in the first two years, involved analysis of one-year program effects in the Year Three cross-sectional samples. The second approach was designed to exploit the fact that some schools and students were in the evaluation samples for the full three years of the study; it examined achievement growth trends and treatment-control differences in the longitudinal samples over the three-year period, using data from six different test administrations.

Analysis procedures and results are presented below in four major sections. The first section discusses the origin and metrics of the major outcome measures for the impact analysis. The second defines the cross-sectional and longitudinal samples on which the impact analyses were based. In the third section, procedures for the cross-sectional impact analyses are briefly summarized (since they closely parallel the procedures described at length in the Year Two Report*), and results of those analyses are discussed. Finally, the rationale and methodology for the longitudinal analyses are described, and results of those analyses are presented.

A. OUTCOME MEASURES

As in the previous year, the outcome measures for Year Three analyses were achievement test scores in reading and mathematics, and scores on indices derived from the School Climate Questionnaire (SCQ) items. Achievement tests and SCQs were administered to all sample students near the beginning and end of the school year.

For all analyses at the secondary level, the values of the achievement scores reported in this chapter are based on the publisher's scale scores associated with each student's raw scores. These scale scores are determined by the use of the test publisher's normative tables, and allow the scores from alternative forms of the test to be converted to a single scale. The Achievement Development Scale Score of the California Achievement Test (Level 5) was used as the mathematics outcome, and the Reading Power Scale Score of the Iowa Silent Reading Test (Level 2) was used as the reading outcome.

At the elementary level, two sets of achievement scale scores were used. First, all cross-sectional analyses were performed with the publisher's reading and mathematics scale scores for the California Achievement Test, Level 2 (grade 3) and Level 3 (grades 4 and 5). Then, all analyses were repeated with special ESAA scale scores. The purposes and derivation of these special scale scores are described briefly in Appendix VI-A of this report and in more specific detail in the ESAA Final Study Design.** Because the two sets of scores yielded comparable results for the cross-sectional analyses, and only the ESAA scales are appropriate for the longitudinal analyses, all results in this chapter are expressed in terms of the ESAA scale scores.

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*The Second Year of Emergency School Aid Act (ESAA) Implementation. System Development Corporation, TM-5236/009/00, July 1976.

**ESAA Combined Evaluation Final Study Design: Volume III. System Development Corporation, TM-5236/015/00, February 1977.

The School Climate Questionnaire (SCQ) scales are described in Chapter IV. Each scale represents a composite of items dealing with student perceptions about one aspect of school climate, with particular emphasis on interracial relations and desegregation. Scales at the elementary level include indices of the students' perceptions of their treatment by the school principal (TP) and of the quality of their interactions with teachers (TSI). Secondary-level scales include a TSI scale; indices of perceived treatment by principals and vice-principals (AD1) and by counselors (AD2); and an index of alienation (IAL). Two additional measures used in secondary schools with racially heterogeneous student bodies were a Perceived School Discrimination (PSD) scale and a Student Intergroup Relations (SIR) scale.

From the initial conception of the ESAA evaluation design, school climate data (as reflected in the students' perceptions of their interactions with peers and with authorities) were considered one of the most important types of information to be collected in the study, and were ranked equally with achievement scores as major outcome data for assessing program effects. Unfortunately, as discussed in Chapter IV, the School Climate Questionnaire scales developed for this study were found to have such questionable psychometric characteristics that their utility for the impact analyses is probably marginal, at best. Pretest-posttest score changes on the scales were consistently small, and there was little chance that any significant treatment-control differences could be found. For this reason, despite our continuing interest in the affective domain associated with desegregation and racial attitudes, the results of impact analyses using SCQ scales are discussed here only in passing, and tables representing the treatment-control comparisons are relegated to the appendices.

B. IMPACT ANALYSIS SAMPLES

As in the first two years of the evaluation, an analysis of the outcome scores for Year Three was conducted for each grade level within the Pilot Elementary, Basic Elementary, and Basic Secondary samples. The sample defined by all paired (treatment and control) schools and by all participating students in these schools in the third year is designated as the cross-sectional sample. It should be kept in mind that because no new schools were selected at the beginning of the third year, all Year Three sample schools were in the evaluation for at least one previous year. Some students, however, were new to the study in Year Three (e.g., third- and tenth-grade students, and replacement students at other grade levels). In addition, some schools changed their programs between school years, dropping or adding grade levels, so that the number of schools across grade levels within a given evaluation sample was not as constant as in previous years.

The longitudinal sample consisted of the school and students who participated in all three years of the evaluation. Specifically, the elementary longitudinal sample was defined to include any student who was pretested as a third-grade student in Year One and who was present for the posttest as a fifth-grade student in Year Three. The school-level longitudinal sample was then defined to include those schools that had any students meeting the longitudinal specification. An analogous definition holds for the secondary sample; that is, students who began in Year One as tenth graders and ended in Year Three as twelfth graders define the longitudinal cohort.

It should be noted that by this definition of the longitudinal samples, some schools that participated in the evaluation for three years are not counted in those samples. Such a situation exists for schools that did not have all three grades of interest participating in the study, or for schools in which no students participated in all three evaluation years. Furthermore, there is only one longitudinal cohort within each evaluation sample; this contrasts with the cross-sectional analysis, where results for a particular sample can be examined in each grade for possible patterns or for consistency.

C. YEAR THREE CROSS-SECTIONAL IMPACT ANALYSIS

The statistical methodology employed in assessing program impact paralleled that used in the first two years. A treatment-by-blocks analysis-of-variance framework was applied, where the treatment dimension was defined by the assignment or denial of ESAA funds to schools, and where districts were considered blocks. The use of this design increases the precision with which treatment effects are assessed, over that obtainable by a simple comparison of the averaged treatment and control outcomes. This increase in precision is achieved by taking into account the known variability among districts. To the extent that the districts differed along dimensions associated with the outcome measures, the use of the treatment-by-blocks design removed the contribution of between-district variability from the error variances and reduced the standard error of the estimate of treatment effect.

Outcome scores presented in the tables below are based on the ESAA scale scores, as previously defined. Both pretest and posttest achievement scores were available for 2,752 students in the Pilot Elementary sample, 4,863 students in the Basic Elementary sample, and 1,926 students in the Basic Secondary sample. The scores used in the statistical analysis (analysis of variance) are the simple pretest-posttest differences in values of the student scores, aggregated to the appropriate grade level within each school. For example, the score used for any given school in the analysis of reading gains for the Pilot third-grade sample is simply the difference between the mean reading level at the pretest and the mean reading level at the posttest for third-grade students who were present on both occasions.

In addition to simple gain scores, residualized posttest scores were again used as a check against anomalous results. While the simple mean scores and gains are reported in this chapter for ease of interpretation, all cross-sectional analyses were also performed with covariate-adjusted posttest scores, where the set of covariates included pretest scores and student demographic variables (primarily racial/ethnic group and socioeconomic status). In no case did use of the alternative (adjusted) outcome alter the interpretation of impact analysis results reported here.

Unlike previous years, no use was made in the Year Three analyses of additional blocking variables, such as differences in program funding levels. It was felt that such blocking would again be unproductive, especially because of the decrease in sample sizes in the third year and the loss of statistical power that would result from the use of more dimensions in the analysis of variance.

The analyses presented immediately below are directed toward the assessment of overall program impact across all students and schools in the samples of paired treatment and control schools participating in the third year of the evaluation. Analyses are described separately for each of the three evaluation samples.

1. BASIC ELEMENTARY SAMPLE

The Basic Elementary sample was unique in that all schools in the sample had participated in the evaluation since the first year. Because of the large initial size of this sample, no augmentation was necessary in the second year, and a large proportion of the schools remained in the study through the end of the third evaluation year. Thus, effects attributable to program maturation were most likely to be found in these schools. Such maturation effects could manifest themselves in a number of ways. For example, considerable time is required for training teachers to use new materials, acquiring and installing new materials and equipment, and developing new curricula before an instructional program can run smoothly. The Basic Elementary sample schools, with their three continuous years of ESAA funding, probably had the best opportunity to complete their start-up activities and to operate efficiently.

A second factor important to the evaluation is that only the Basic Elementary sample showed significant treatment-control differences in total per-pupil funding (see Chapter V). Differences in the Pilot Elementary and Basic Secondary samples, though tending to favor the treatment schools, were too small to reach statistical significance. Here again, then, the Basic Elementary sample appears to offer the best prospects for showing ESAA program impact on the outcome measures.

The Year Two Report noted that the Basic Elementary sample showed increasing but statistically non-significant signs of an ESAA treatment effect, and promised that Year Three data would be examined closely for possible evidence that this trend was continuing and perhaps growing in strength. The major data needed to pursue this issue for the Year Three cross-sectional sample of Basic Elementary schools are presented below in Table VI-1. This table contains the treatment and control means and difference scores for pretest, posttest, and gain, by outcome and grade level. Significance tests were conducted on all treatment-control differences. It should be noted that of the six treatment-control comparisons performed on gain scores (representing the combination of three grade levels and two outcome measures), five favored the treatment group. Furthermore, two of these differences (fifth-grade reading and fourth-grade math), both favoring the treatment schools, were statistically significant. Thus, overall, the evidence seems fairly strong for a positive ESAA program impact on achievement within the Basic Elementary sample.

Two procedures were used to verify that the signs of positive treatment effects for the fourth and fifth grades did not result from initial treatment-control differences in achievement or other student characteristics. First, as previously noted, all analyses were repeated with posttest scores adjusted for pretest level, race/ethnicity, and socioeconomic indices; these reanalyses did not change the patterns of effects. For example, mathematics gains at the fourth-grade level showed similar treatment effects whether simple gains or adjusted posttest scores were used in the analyses. Second, another set of analyses was performed in which the total distribution of school pretest means was divided into four levels. The gains for treatment and control schools falling within each level are shown in Appendix VI-B. These analyses, which are functionally similar to blocking on pretest levels, again show consistent treatment effects for the grades and outcomes where the overall effects were significant. In summary, it appears unlikely that the evidence of ESAA program impact found in grades four and five was simply an artifact of initial treatment-control differences.

TABLE VI-1. YEAR THREE ANALYSIS OF ACHIEVEMENT OUTCOMES*: BASIC ELEMENTARY CROSS-SECTIONAL SAMPLE

Grade Level	Number of Pairs	Group	Reading			Mathematics		
			Pretest	Posttest	Gain	Pretest	Posttest	Gain
3	21	Treatment	488.7	527.2	38.5	443.0	504.2	61.2
		Control	513.1	551.4	38.3	459.3	523.9	64.6
		T-C Difference	-24.4**	-24.2**	0.2	-16.3**	-19.7	-3.4
4	22	Treatment	543.3	579.0	35.7	526.3	573.2	46.9
		Control	562.4	590.2	27.8	541.8	578.8	37.0
		T-C Difference	-19.1	-11.2	7.9	-15.5	-5.6	9.9**
5	21	Treatment	597.3	623.9	26.6	598.1	634.9	36.8
		Control	617.3	635.5	18.2	611.2	642.0	30.8
		T-C Difference	-20.0	-11.6	8.4**	-13.1	-7.1	6.0

*Achievement outcomes are expressed in units of the ESAA scale scores.

**A statistically significant treatment-control difference ($p \leq 0.05$ level) is present. Positive differences indicate higher treatment scores than control scores, and negative differences indicate higher control scores.

At the third-grade level, where evidence of treatment effects was lacking, students in the control schools had a significantly higher pretest level ($p < .05$) than those in the treatment schools; thus, one might infer that third graders in the Year Three treatment and control schools were drawn from different populations, and that ordinary comparisons of the two groups are probably inappropriate. Although covariance procedures were attempted, the methodological literature indicates that such procedures are likely to underestimate treatment effects when the treatment group starts at a significantly lower level. It is therefore difficult, if not impossible, to interpret this study's finding that at the third grade, the treatment and control schools made roughly similar gains despite their initial inequity.

As indicated earlier, changes in the School Climate indices between pretest and posttest administrations were minimal. No significant differences in the treatment and control change scores were found at any grade level or for either SCQ outcome (see Appendix VI-C).

2. BASIC SECONDARY SAMPLE

Of the three evaluation samples, the Basic Secondary sample showed the smallest treatment-control difference (favoring treatment schools) in total per-pupil funding. It is not surprising, therefore, that this sample showed no ESAA impact (treatment-control difference) for either achievement outcome, at any of the three grade levels (see Table VI-2). As in the Basic Elementary sample, there was some evidence, particularly for twelfth-grade reading, of higher initial performance in control schools than in treatment schools. Changes between pretest and posttest administrations of the School Climate Questionnaire are shown in Appendix VI-D.

3. PILOT ELEMENTARY SAMPLE

The results of the analyses of the Pilot achievement data are summarized in Table VI-3. As shown in this table, no significant differences were found between treatment and control groups in either outcome, at any of the three grade levels.

TABLE VI-2. YEAR THREE ANALYSIS OF ACHIEVEMENT OUTCOMES*: BASIC SECONDARY CROSS-SECTIONAL SAMPLE

Grade Level	Number of Pairs	Group	Reading			Mathematics		
			Pretest	Posttest	Gain	Pretest	Posttest	Gain
10	14	Treatment	126.3	128.1	1.8	490.0	500.5	10.5
		Control	126.1	127.6	1.5	491.0	494.6	3.6
		T-C Difference	0.2	0.5	0.3	-1.0	5.9	6.9
11	14	Treatment	136.2	136.0	-0.2	522.9	528.6	5.7
		Control	140.4	140.8	0.4	528.2	531.1	2.9
		T-C Difference	-4.2	-4.8	-0.6	-5.3	-2.5	2.8
12	13	Treatment	139.9	137.7	-2.2	531.4	517.9	-13.5
		Control	145.7	141.7	-4.0	547.4	545.9	-1.5
		T-C Difference	-5.8**	-4.0	1.8	-16.0	-28.0	-12.0

*At the secondary level, the reading scores are the Reading Power Scales of the Iowa Silent Reading Test (Level 2); the mathematics scores are expressed in Achievement Development Scale Score units on the mathematics subtest of the California Achievement Test (Level 5).

**A statistically significant treatment-control difference ($p \leq 0.05$ level) is present. Positive differences indicate higher treatment scores than control scores, and negative differences indicate higher control scores.

TABLE VI-3. YEAR THREE ANALYSIS OF ACHIEVEMENT OUTCOMES*: PILOT ELEMENTARY CROSS-SECTIONAL SAMPLE

Grade Level	Number of Pairs	Group	Reading			Mathematics		
			Pretest	Posttest	Gain	Pretest	Posttest	Gain
3	10	Treatment	465.0	497.1	32.1	437.1	487.1	50.0
		Control	464.0	499.8	35.8	431.6	491.9	60.3
		T-C Difference**	1.0	-2.7	-3.7	5.5	-4.8	-10.3
4	11	Treatment	519.6	555.4	35.8	517.6	565.8	48.2
		Control	512.3	551.3	39.0	517.0	556.9	39.9
		T-C Difference	7.3	4.1	-3.2	0.6	8.9	8.3
5	13	Treatment	575.2	598.6	23.4	584.2	613.4	29.2
		Control	584.0	602.3	18.3	595.9	616.7	20.8
		T-C Difference	-8.8	-3.7	5.1	-11.7	-3.3	8.4

*Achievement outcomes are expressed in units of the ESAA scale scores.

**Positive differences indicate higher treatment scores than control scores, and negative differences indicate higher control scores.

The significant differences favoring the control schools at the fifth-grade level (both outcomes) in the Year Two data were no longer present in Year Three. Year Three differences, while not significant, favored the treatment schools. In addition, the larger treatment gains in the fifth-grade treatment group were associated with lower pretest scores; that is, treatment students, on the average, began Year Three at a lower initial level than their control peers, but through larger gains made during the year, reduced the disparity between the groups.

Appendix VI-E summarizes the findings from analyses of the School Climate outcomes.

D. THREE-YEAR LONGITUDINAL IMPACT ANALYSIS

An important aspect of the ESAA evaluation study design was the provision for maintaining two longitudinal cohorts of students through the three years of the evaluation. In fact, 302 students in the Pilot Elementary sample, 904 students in the Basic Elementary sample, and 177 students in the Basic Secondary sample were retained through the three evaluation years. By following those students who began the first year of the study at the lowest grade level (third grade for the elementary samples and tenth grade for the secondary sample) through the succeeding years, data were obtained to trace the students' academic growth over three years of instruction. For the students in each cohort, achievement data were available on six occasions, and School Climate data were available on four occasions. (The School Climate Questionnaire was administered only in the second and third years of the study.) These data were used, first, to determine the general shape of the learning curves reflecting academic achievement, and second, to assess possible differential achievement between treatment and control groups.

This section deals exclusively with data from the longitudinal samples, as defined in the first section of this chapter. It describes the methodology used to analyze the longitudinal data, and then summarizes the results for each evaluation sample. As in the preceding section of this chapter, results using scales from the School Climate Questionnaire are summarized in tables in the appendices, and the discussion here focuses primarily on achievement test results.

1. METHODOLOGY

Outcome measures for the following set of analyses are the school-level means of the two achievement test scores from each of the six test administrations, and the mean School Climate indices from each of the four administrations of that instrument. The occasions upon which the data were collected were originally intended to provide measures of change in student achievement over a full school year of instruction. In fact, however, the average interval between two successive tests was approximately six months. (The reduced pretest-posttest intervals resulted primarily from unavoidable delays in getting rosters of ESAA-participating students from the districts at the start of each school year.)

In the analyses of the longitudinal data, transformations were applied to the original scores so as to define a new set of scores that would indicate more directly and simply the various components of time trend. The transformations allowed analysis of the fit of various time-dependent curves to the observed scores, in order to determine the shape of academic growth over time. A brief summary of the analytical methods used in the analysis of the time trends appears in Appendix VI-F.

The following discussion of results for each of the three evaluation samples presents tables of the overall treatment and control means for each occasion on each outcome; where significant time trends were found, the data are graphically represented and discussed.

2. BASIC ELEMENTARY LONGITUDINAL RESULTS

Achievement ESAA scale score means for the two outcomes on each of the six test occasions are summarized in Table VI-4 and graphically represented in Figures VI-1 and VI-2.

For both reading and mathematics, the results show a strong linear trend of fairly consistent achievement gains between each two successive testing

TABLE VI-4. MEAN ACHIEVEMENT PERFORMANCE FOR BASIC ELEMENTARY LONGITUDINAL SAMPLE (N = 17 PAIRS OF SCHOOLS)

Outcome*	Group	Year One		Year Two		Year Three	
		Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Reading	Treatment	478.6	520.8	549.0	582.2	605.6	628.4
	Control	491.4	533.5	562.9	594.2	624.2	640.1
	T-C Difference**	-12.8	-12.7	-13.9	-12.0	-18.6	-11.7
Math	Treatment	432.5	500.1	530.7	575.0	607.4	639.2
	Control	442.8	512.8	544.1	583.8	617.8	648.5
	T-C Difference	-10.3	-12.7	-13.4	-8.8	-10.4	-9.3

*Achievement outcomes are expressed in units of the ESAA scale scores.

**Positive differences indicate higher treatment scores than control scores, and negative differences indicate higher control scores.

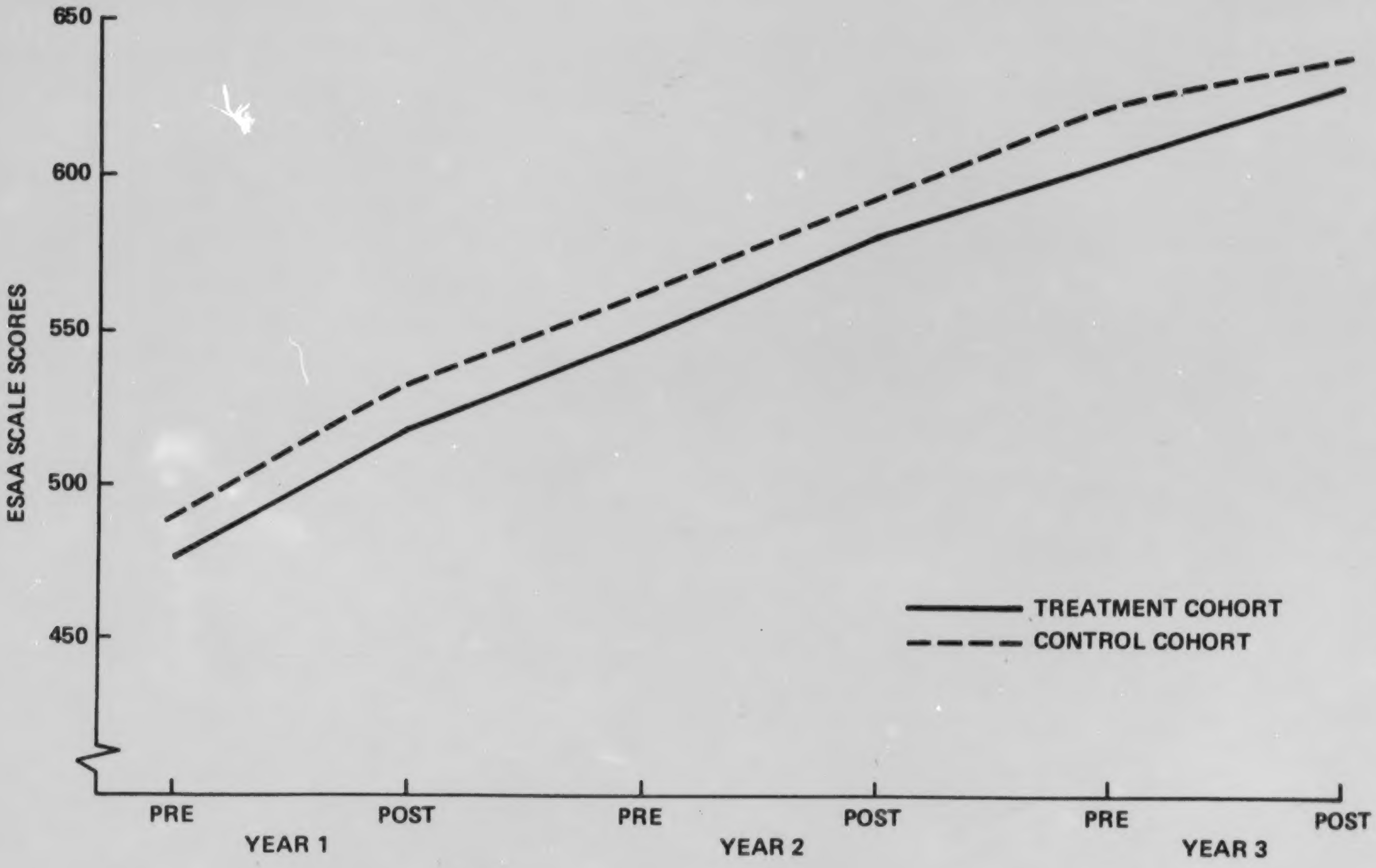

Figure VI-1. Reading Achievement Growth Curves: Basic Elementary Longitudinal Sample

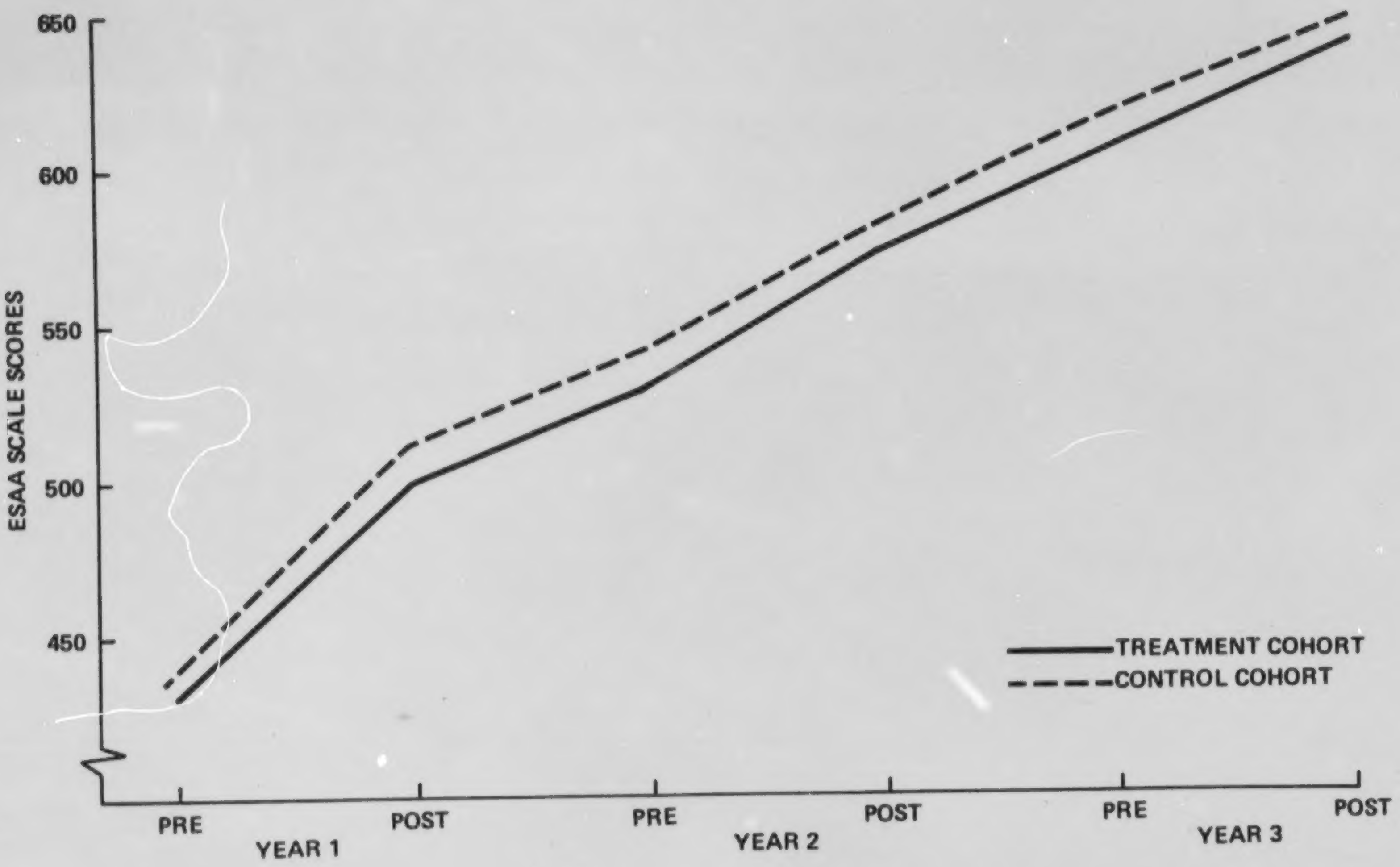

Figure VI-2. Mathematics Achievement Growth Curves:
Basic Elementary Longitudinal Sample

occasions. Graphs for mathematics also show a quadratic trend, probably reflecting accelerated growth in the third grade; no significant second-order trend is apparent for reading. No significant differential effects are evident between the treatment and control groups; the control group began at a higher level and stayed higher in both reading and math. However, it can be seen (Figure VI-1) that for reading, the disparity between the two groups decreased in Year Three; though non-significant, this trend seems consistent with the evidence of ESAA program impact found for Year Three in the Basic Elementary cross-sectional sample.

No significant trends or score differences were found for either of the two School Climate outcomes. The means for each outcome on each occasion are presented in Appendix VI-G.

3. BASIC SECONDARY LONGITUDINAL RESULTS

The achievement test scores for the longitudinal cohorts at the secondary level are summarized in Table VI-5. It should be remembered that these scores, unlike the scores reported at the elementary level, are reported in their original (publisher's) scale score values. Furthermore, since the scores for reading and mathematics achievement are derived from different measures, the scales are not comparable.

While scores tended to increase slightly over time, there were no significant trends in the secondary achievement data. There was a significant difference in reading achievement in favor of the control schools, both at the end of the eleventh grade and the beginning of the twelfth grade, but this difference was not reflected in differential trend components in the two groups.

In general, it appears that secondary-level ESAA-eligible and -participating students learned little. This explanation is supported by the results from the cross-sectional analysis of each separate year's data, where negligible gains and even occasional score declines were found.

TABLE VI-5. MEAN ACHIEVEMENT PERFORMANCE FOR BASIC SECONDARY LONGITUDINAL SAMPLE
(N = 7 PAIRS OF SCHOOLS)

Outcome*	Group	Year One		Year Two		Year Three	
		Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Reading	Treatment	128.7	129.9	133.5	132.2	135.5	136.6
	Control	133.3	132.9	138.2	139.1	146.6	140.4
	T-C Difference	-4.6	-3.0	-4.7	-6.9**	-11.1**	-3.8
Math	Treatment	478.2	498.4	499.5	505.1	502.4	513.1
	Control	493.2	508.5	518.5	516.5	533.0	524.6
	T-C Difference	-15.0	-10.1	-19.0	-11.4	-30.6	-11.5

*At the secondary level, the reading scores are the Reading Power Scales of the Iowa Silent Reading Test (Level 2); the mathematics scores are expressed in Achievement Development Scale Score units on the mathematics subtest of the California Achievement Test (Level 5).

**A statistically significant treatment-control difference ($p \leq .05$) is present. The negative difference indicates that control scores were higher than treatment scores.

The School Climate scores again show very little change over time. Summary means presented in Appendix VI-H indicate no significant overall or differential trends in these data.

4. PILOT ELEMENTARY LONGITUDINAL RESULTS

The achievement test score means (ESAA scale scores) for both the reading and mathematics outcomes are presented in Table VI-6. For both sets of outcomes, a statistically significant linear trend indicating steady overall achievement growth was found to represent the data. No difference was found in the linear trends between treatment and control groups.

For the reading outcome (see Figure VI-3), a statistically significant overall quadratic trend was also discovered. Inspection of the graphically presented data indicates some deceleration of the positive linear trend at the later testing points. No significant differences were found in the quadratic trend components between treatment and control groups. The two significant trends, taken together, may indicate a slowing of growth in reading achievement as children reach the upper elementary grades.

The mathematics achievement results are presented in Figure VI-4. In these data, no trend component beyond the linear was found to be significant, either generally or differentially for treatment and control groups. For this sample, mathematics achievement appears to be a strongly linear function of testing occasion, indicating fairly uniform growth over time.

The levels of performance on the two School Climate scales at each administration are summarized in Appendix VI-J. Analyses of the linear and quadratic trends in these data indicate no significant general or group-differential trends.

TABLE VI-6. MEAN ACHIEVEMENT PERFORMANCE FOR PILOT ELEMENTARY LONGITUDINAL SAMPLE
(N = 8 PAIRS OF SCHOOLS)

Outcome*	Group	Year One		Year Two		Year Three	
		Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Reading	Treatment	454.5	498.9	517.0	563.2	594.0	606.6
	Control	470.1	508.6	533.3	574.0	604.7	615.3
	T-C Difference**	-15.6	-9.7	-16.3	-10.8	-10.7	-8.7
Math	Treatment	417.4	490.6	523.6	563.4	597.0	617.3
	Control	422.6	488.8	512.3	574.4	598.6	628.3
	T-C Difference	-5.2	1.8	11.3	-11.0	-1.6	-11.0

*Achievement outcomes are expressed in units of the ESAA scale scores.

**Positive differences indicate higher treatment scores than control scores, and negative differences indicate higher control scores.

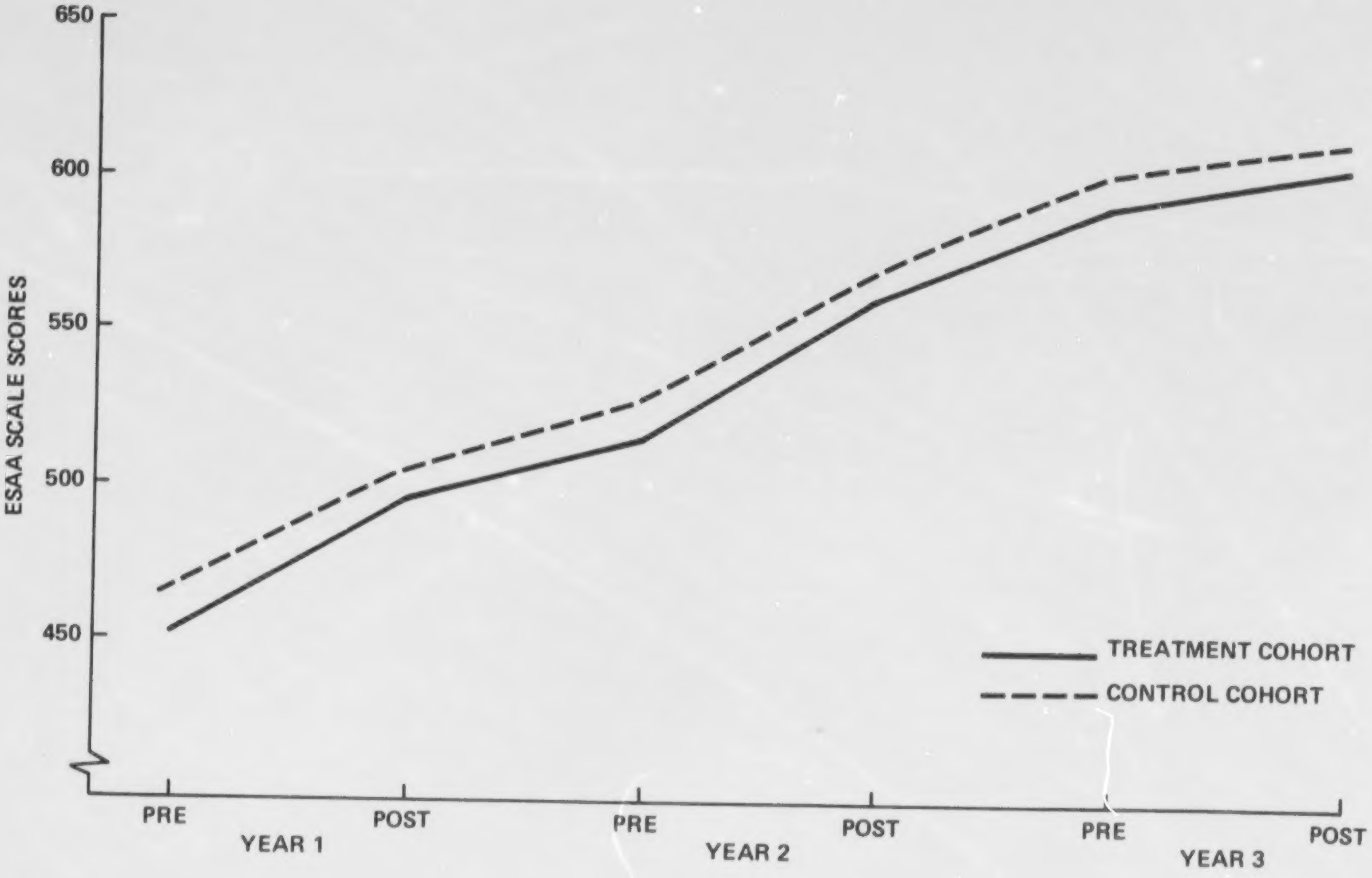

Figure VI-3. Reading Achievement Growth Curves:
Pilot Elementary Longitudinal Sample

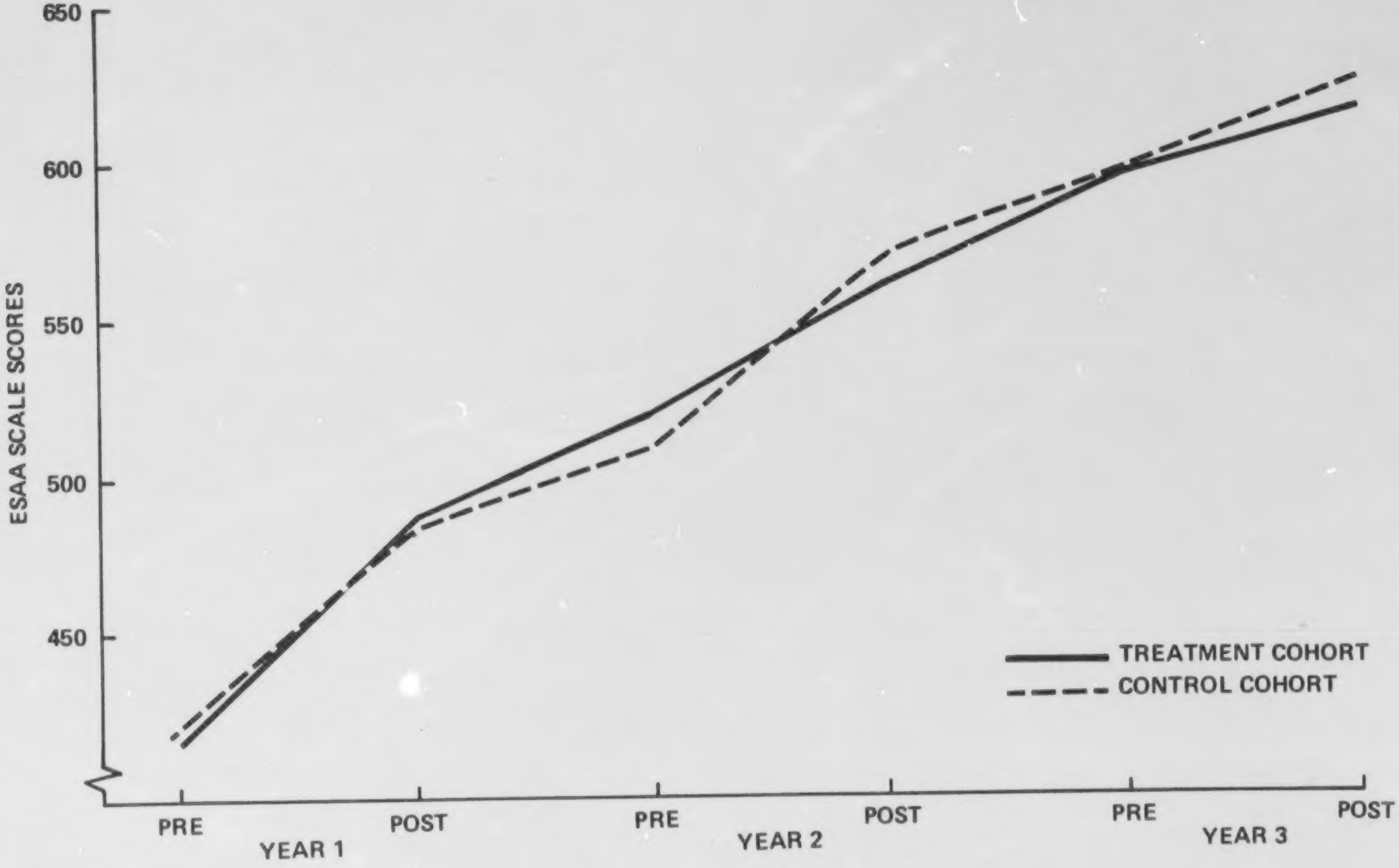

Figure VI-4. Mathematics Achievement Growth Curves:
Pilot Elementary Longitudinal Sample

E. SUMMARY AND INTERPRETATION OF RESULTS

1. CROSS-SECTIONAL ANALYSES

Overall, the results of the treatment-control comparisons for the Year Three cross-sectional samples indicate a positive ESAA program impact on achievement in the Basic Elementary sample, at least for some combinations of grade level and outcome measure; however, there is no evidence of such impact in the Basic Secondary or Pilot Elementary sample. These findings raise two questions:

- Why did ESAA funds have an apparent impact on the Basic Elementary sample, but not on the other two samples?
- Why was program impact for the Basic Elementary sample stronger in Year Three than in the previous two years?

A partial answer to the first question may be in the treatment-control funding differences for the three samples in Year Three. In that year, only the Basic Elementary sample showed a statistically significant difference favoring the treatment schools in total per-pupil expenditures. That difference, which amounted to almost $400 per pupil, resulted from a sizable treatment-control difference in both ESAA and other supplemental funds. In the other two samples, although treatment schools had somewhat higher per-pupil funding than control schools, the differences were relatively small (about $90 for the Basic Secondary sample, and $130 for the Pilot Elementary sample), and neither was statistically significant.

Another difference in Year Three between the Basic Elementary sample and the other two samples was that only in the Basic Elementary sample were the allocations of supplemental funds for reading and math significantly larger (.05 level) in treatment schools than in control schools. Since reading and math were the activities with the closest logical relationship to the study's achievement outcome measures, one might infer that evidence of ESAA program impact (i.e., treatment-control outcome differences favoring the treatment schools) would be more probable in the Basic Elementary sample than in either of the other two samples.

Finally, analyses of staff time allocations for Year Three (Chapter V) showed a consistent, though non-significant, pattern in the Basic Elementary sample of greater per-student staff resource utilization for reading and math instruction in treatment schools than in control schools. In the Pilot Elementary and Basic Secondary samples, by contrast, the pattern was mixed, with the control schools often making greater staff commitments in reading and math than the treatment schools.

Thus, *in Year Three, only the Basic Elementary sample met the major assumptions underlying the impact study's experimental design*. That is, only for that sample did the treatment schools significantly exceed the control schools in total per-pupil funding, and in dollar allocations for activities directly related to the study's achievement outcome measures. It seems logical to conclude, therefore, that only in the Basic Elementary sample could one realistically expect significant outcome differences indicating ESAA program impact.

The second question posed at the beginning of this discussion asked why stronger evidence of ESAA program impact for the Basic Elementary sample was found in Year Three than in previous years. There seem to be three possible explanations for this finding. First, the treatment-control funding differences might not have become sufficiently large to produce significant treatment effect until Year Three. Second, selective attrition of ESAA projects might have occurred over the three evaluation years; that is, weaker, less successful projects might have been eliminated from further funding at the end of Years One and Two, either by deliberate screening on the part of USOE, or by some self-selection process. If such selective attrition occurred, the sites remaining for the Year Three evaluation and impact analyses would represent the "cream" of the original (Year One) ESAA projects. The third possible interpretation is that the Year Three impact findings reflect increasing program maturity.

By the third year of ESAA operations, the sample projects might have completed many preliminary, "start-up" activities, such as staff development and new curriculum design, thus enabling them to focus more effectively on their work with the students.

Although these three alternative explanations cannot be tested here definitively, reasonable inferences about their relative likelihood can be drawn from a more detailed examination of the Basic Elementary impact data. Toward this end, the following paragraphs discuss the three possible explanations.

The first explanation or hypothesis assumes that treatment-control expenditure differences were substantially greater in Year Three than in previous years. Certainly the $400 treatment-control difference reported for the Basic Elementary sample in Year Three is much larger than the $43 difference reported in Year One, or the $52 reported in Year Two. However, this apparent difference between Year Three and previous years could simply reflect the revised and more precise calculation procedures used in Year Three (see Chapter V). Ideally, the revised procedures would be used on the expenditure data for Years One and Two, to determine how much this would change the earlier calculations. Unfortunately, however, the new calculation methods require certain data not available for the earlier years. It was therefore decided to recalculate the Year Three per-pupil expenditure figures, using the old formulas. The rationale was that if the recalculations produced Year Three treatment-control differences as small as those found in Years One and Two, one could reasonably assume that treatment-control differences had, in fact, changed little over the three years of the study.

Table VI-7 shows the recalculated per-pupil expenditures for the Year Three Basic Elementary sample. It can be seen that the treatment-control difference in Year Three values, when calculated in this manner, is much smaller ($81) than was indicated by the improved calculation procedures developed for the Year Three analyses ($400). Nevertheless, the data still show a pattern of increases in treatment-control expenditure differences from year to year that is consistent with the increasing strength of the treatment-control differences in achievement gains. Thus, one cannot entirely reject the explanation that the apparent treatment effect in Year Three resulted from the increase in treatment-control expenditure differences. It seems questionable, however, that the increase in treatment-control expenditure differences between Years Two and Three was sufficiently large to be the only explanation for the Year Three impact finding.

TABLE VI-7. FUNDING PATTERNS (TOTAL PER-PUPIL EXPENDITURES) ACROSS THE THREE EVALUATION YEARS FOR THE BASIC ELEMENTARY SAMPLE

Group	Total Per-Pupil Expenditures		
	Year One	Year Two	Year Three
Treatment	$1078	$1238	$1257
Control	$1035	$1184	$1176
T-C Difference	$ 43	$ 54	$ 81

The second explanatory hypothesis, that of selective program attrition, was addressed by looking at the first-year achievement results for programs that participated in all three years and for those that were lost from the sample after the first or second year. In these analyses, the overall treatment-control difference for longitudinal districts was compared to the treatment-control difference for the set of districts lost from the sample. If poorer programs had left the sample, the t-test performed on the comparison of the two group means should have indicated a significantly larger effect for the longitudinal sample. The test yielded mixed results across grades and outcomes (see Appendix VI-K). The one significant difference indicated greater success in control schools from districts that did not remain in the evaluation through the third year. This analysis would seem to rule out selectivity in the sample as the explanation of third-year impact results.

Finally, the hypothesis of enhanced program maturation cannot be verified or refuted on the basis of available data. Such a hypothesis seems quite logical, however, as new programs such as ESAA necessarily devote a large part of their effort in early years to planning and reorganization, staff recruitment and training, and development of essential materials. In later years of a project's life, these start-up activities can be reduced greatly in favor of activities more immediately and directly beneficial to students, such as actual classroom instruction, and preparation and implementation of daily lesson plans. The best conjecture at this point, therefore, is that the increased treatment effect (ESAA program impact) found for the Basic Elementary sample in Year Three resulted from a combination of an increasing advantage in school expenditures for treatment schools over control schools, and increasing program maturation and effectiveness in the ESAA projects.

2. LONGITUDINAL ANALYSES

Plots of the reading and math achievement growth curves for the Basic and Pilot Elementary samples (Figures VI-1 through VI-4) show fairly consistent gains across the six data points. (Basic Secondary sample data showed virtually no overall achievement gains, and were therefore not plotted.) It should be noted, however, that the overall linearity of the slopes is, at least in part, a natural result of the procedures used to rescale the data.

In general, there is no clear evidence of cumulative ESAA program impact (i.e., increasing treatment-control differences in outcomes) over the three years of the evaluation for any of the longitudinal samples. For most combinations of sample and achievement outcome measures, the control groups started slightly higher (though in general not significantly so), and stayed slightly higher over successive test administrations, with little sign of any "catch-up" by the treatment group. One encouraging exception may be in reading achievement for the Basic Elementary sample. Here, the gap between treatment and control schools was reduced between pretesting and posttesting in Year Three. Although this convergence trend was not statistically significant, it seems entirely consistent with the finding of apparent ESAA program impact for the Year Three Basic Elementary sample.

CHAPTER VII

RELATIONAL ANALYSES

Several exploratory analyses were performed on data for the Year Three cross-sectional samples and the three-year longitudinal samples, to identify district, school, program, and class/teacher variables associated with improved student achievement. The design underlying these analyses was quasi-experimental, as neither students nor schools were randomly assigned to the different treatment conditions being compared. No meaningful relationships were found in the longitudinal data, but the cross-sectional data revealed several such relationships. A positive association was found in both Pilot and Basic Elementary samples between total per-pupil expenditures and pupil reading outcomes. The Pilot sample also showed positive relationships between per-pupil expenditures and achievement in mathematics. Despite these general trends, however, the Year Three data failed to show a "critical mass" expenditure level of the type tentatively identified in the report for Year Two. As in previous years, significant relationships were found between student reading achievement and desegregation-supporting activities in Basic sample schools; however, the elementary and secondary schools showed conflicting trends in the directions of those relationships, possibly reflecting different stages of desegregation at the elementary and secondary levels.

The purpose of the Year Three relational analyses was to identify specific program characteristics or components that were associated with larger student achievement gains.* Treatment and control schools were pooled for these analyses, as the focus was on program effects irrespective of funding source. As in the previous years' studies, the relational analyses were quasi-experimental rather than experimental in nature; that is, they were based not on random assignment of students or schools to different treatment conditions, but on naturally occurring variations in program resources and approaches across the sample sites.

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*Improvement in race-related school climate was also used as an outcome measure for these analyses. However, as explained in Chapter IV, the psychometric properties of the School Climate Questionnaire were rather poor. Probably for this reason, the climate indices showed virtually no meaningful relationships to program approach, and are not discussed further in this chapter.

Before summarizing the methodology and results of the relational analyses, it may be helpful to examine the kinds of results that might have been expected from these analyses. Specifically, it seems useful to ask what portion of the total variance in student achievement was likely to be represented by variance among classes and schools, rather than among students within classes and schools. Estimation of these variance components helps to determine the percentages of variance in achievement that could theoretically be accounted for, under ideal conditions, by studying all possible predictive program variables operating at the school and classroom (teacher) levels. Stated more simply, the components analyses provide insights concerning absolute limits to the strengths of relationships that this study could expect between school/teacher variables and achievement gains.

The proportions of variance accounted for by the schools and classrooms were obtained from a series of unbalanced, nested analyses of variance, using schools, classrooms within schools, and students within classrooms as the factors of the model. For each criterion variable (e.g., reading pretest score, reading posttest score), a separate analysis was performed on each of the six elementary Year Two samples (i.e., the third-, fourth-, and fifth-grade Pilot samples, and the third-, fourth-, and fifth-grade Basic samples). The components of variance were estimated, using the mean square term and the expected mean square model for each factor. The values reported in Table VII-1 for each criterion variable are the means of the six calculated estimates.

Key results of the components analyses, shown in Table VII-1, indicate that simple school effects (i.e., effects not considering interactions between school variables and other mediating variables at the student or classroom level) and simple classroom effects, combined, could account for a maximum of about one-third of the total variability in test performance. Further, these effects could account for even smaller portions (between 5 and 13 percent) of the variability in the change measures (simple gains and residualized posttest scores). These limits are theoretical, and actual percentages of variance accounted for by any particular set of program measures are probably much smaller.

TABLE VII-1. MEAN PERCENTAGE OF VARIANCE ACCOUNTED FOR BY SCHOOLS AND CLASSROOMS, FOR EIGHT CRITERION VARIABLES*

Criterion Variable	Percentage of Variance Accounted For	
	Schools	Classrooms Within Schools
Reading Total Pretest	16.22	17.97
Reading Total Posttest	13.02	20.73
Mathematics Total Pretest	16.18	11.05
Mathematics Total Posttest	15.32	11.45
Gain Reading Total	4.07	0.73
Gain Mathematics Total	8.03	3.10
Residualized Reading Posttest	3.45	5.78
Residualized Mathematics Posttest	8.57	4.62

*Table entries are means of the percentages for six Year Two elementary cross-sectional samples (Pilot third-, fourth-, and fifth-grade samples, and Basic third-, fourth-, and fifth-grade samples).

Of course, these results apply only to the simple effects of school and classroom variables: they do not take into account the interactions between these variables and individual student variables. In theory, some interaction effects could themselves explain substantial variance in achievement, but the present study was not designed to provide such explanations. Overall, the pattern of findings in the components analyses suggests that the school, teacher, and program variables examined in this study should not be expected to account for large portions of the total variance in student achievement gains, even when those variables are considered in combination.

The remainder of this chapter discusses the methodology and results of the relational analyses. Section A describes the analyses of the Year Three cross-sectional data; Section B, the three-year longitudinal data. One set of cross-sectional analyses examined a small number of predictor variables found to be related to achievement in the previous years' analyses. A second set focused on predictor variables for which data were collected at the individual student level, rather than simply at the school or classroom level (e.g., duration of student exposure to different types of instruction). The third set of cross-sectional analyses examined the relationships of the achievement measures to several variables developed from teacher questionnaire items used for the first time in the Year Three data collection. A final set of cross-sectional analyses attempted to replicate or confirm results of the Year Two analyses of "critical mass" (i.e., the minimum supplemental expenditure level necessary to ensure some measure of program success). Analyses of data for the longitudinal samples included a set of generalized regression analyses relating achievement outcomes to student-level variables. These analyses used only elementary student data.

A. ANALYSES OF YEAR THREE CROSS-SECTIONAL SAMPLE

Analyses discussed in this section examine relationships between program/background variables and student/school outcomes in Year Three. The sample used in these analyses included all students for whom Year Three pretest and posttest achievement scores were available, in contrast with the more restrictive samples used in the impact and descriptive analyses. There were 8,373 students in the combined (Basic and Pilot) elementary samples, and 2,512 students in the secondary sample. The breakdown by program and grade is shown in Table VII-2.

TABLE VII-2. NUMBERS OF STUDENTS IN YEAR THREE CROSS-SECTIONAL SAMPLES

Sample	Grade	Number of Students
Pilot Elementary	3	941
	4	1,046
	5	1,219
Basic Elementary	3	1,638
	4	1,736
	5	1,793
Basic Elementary	10	971
	11	885
	12	656

Different analyses reported here were based on different numbers of students, because of missing data required for some analyses but not for others. On the average, only about five percent of the students had to be excluded from any given analysis because of missing observations; the analytic sizes were kept high for most variables by the insertion of mean values for missing observations.

1. STUDENT-LEVEL ANALYSES

Analyses discussed in this subsection were intended to help identify important interactions occurring at the individual student level. They sought to explain relationships among program, background, and outcome within schools and classrooms. For this reason, all data used in these analyses were either collected at or disaggregated to the student level.

a. Methodology

(1) Definition of Variables

With one major exception, all variables used in the Year Three relational analyses had been used in one or both of the prior evaluation years. The exception is a set of variables obtained from certain teacher questionnaire items used for the first time in Year Three. The following paragraphs describe the major categories of variables and items, including the new teacher variables added for Year Three.

(a) Individual Student Characteristics. Among the variables expected to have the most consistent relationship to learning were several individual student characteristics, including ethnicity, academic orientation (e.g., liking for school, feelings about the importance of good grades, and personal educational expectations), and certain psychosocial characteristics, such as internal/external locus of control. Measures of the educational attainment of the student's parents were also used.

(b) Individual Teacher Characteristics. Selected characteristics of the students' teachers defined a second set of independent variables. These included the teacher's general training and teaching experience, inservice training in reading or math, and indicators of effort and style (such as the number of resources generated by the teacher to supplement instruction, and the flexibility of his or her teaching approach).

The majority of items in the teacher questionnaire were newly developed for the Year Three evaluation. The prior years' evaluations had suggested that much achievement variation might be due to differences in the way individual teachers conducted their classes. To improve the data's sensitivity to these differences, the three basic sections of the teacher questionnaire were revised for Year Three. These sections covered reading instruction; mathematics instruction; and instruction in other ESAA-related areas, use of English as a second language, cultural enrichment, and counseling. In addition, a revised set of questions on school policy and decision-making was incorporated in the teacher instruments. The new questionnaires were intended to get as much detailed information as possible about four aspects of each instructional area: (1) the specific approach or instructional strategy; (2) the materials used for instruction; (3) the personnel available for instructional purposes; and (4) the facilities available.

(c) Instructional Program (Classroom) Characteristics. A third category of variables included certain characteristics of the reading and math programs; these characteristics are described in Chapter V. Potentially important variables were the total amount of time spent in reading and math activities (estimated by average total weekly exposure in reading and math) and the percentage of time spent in several component activities in reading and math instruction.

(d) Contextual (School and District) Characteristics. The broader context of the student's learning environment was defined by school- and district-level variables. Sociodemographic characteristics examined here included minority percentage in the school and overall student-body SES level, as indicated by the principal's estimate of the percentage of students eligible for ESEA Title I funds. Also of interest were the teacher/pupil ratio in the school, and the number of specialized reading and math personnel relative to total staff size.

Other contextual variables used in the exploratory analyses were characteristics related to the desegregation programs and racial climate of the schools. The degree to which districts promoted desegregation programs was indicated by a frequency count of district activities such as media presentations, public meetings, and staff meetings.

Funding variables were a particularly important aspect of the district/school context, since they were a major set of variables in the evaluation design. School-level funding variables were defined in terms of supplemental per-pupil expenditures in reading and math. District cost data were used to define regular per-pupil expenditures.

(e) Dependent Variables. Residualized total scale scores from the reading and mathematics achievement tests were the major dependent variables for the overall relational analyses. At the elementary level, the reading raw score was obtained for performance on the entire reading section of the California Achievement Test, Level 2 (Grade 3) and Level 3 (Grades 4 and 5). At Grade 3, the mathematics test was composed of the items from the computation and concepts subtests, Level 2, omitting the problems section of the latter subtest. For Grades 4 and 5, the mathematics test consisted of items from the computation subtest and the concepts subtest, Level 3, omitting the 20 items dealing with fractions in the computation subtest.

At the secondary level, the reading scores were based on performance on the Iowa Silent Reading Test, Level 2. The reading raw score was a total of raw scores on the Vocabulary and Reading Comprehension subtests. The entire mathematics test of the California Achievement Test, Level 5, was used to obtain the mathematics score used in these analyses.

Total raw scores were converted to total scale (normed) scores, to facilitate direct comparison of results across test forms and test levels. Residualized posttest scores were then calculated. These scores served as the major criterion measures for analyses reported here, as they did in the preceding years' analyses. A residualized posttest score was defined as the difference between a student's observed posttest score and predicted posttest score, where the prediction was based on that student's pretest score. More specifically, regression analyses procedures were used to calculate the residual scores. Two regression analysis were performed at each grade level, one for each dependent variable (reading and mathematics). The total reading and total math scale scores from the achievement pretests were used as predictor variables, and the posttest total scale scores were used as dependent variables. The predicted posttest total scale scores resulting from the regression were then subtracted from the corresponding actual posttest scores to produce the posttest residual scores.

(2) Regression Procedures

The statistical method employed in these overall cross-sectional analyses was linear multiple regression. This technique was chosen for the analyses because of its traditional role in exploratory analysis, and because of the straightforward interpretability of the results it yields. Specifically, the results reported in this chapter were obtained by means of a stepwise multiple regression procedure that builds the final regression equation through a series of steps, each of which adds one independent variable to the equation. The independent variable added at each step of the procedure is the one that contributes most of the predictability of the equation. The advantage of the stepwise regression is that it yields a good approximation of the "best" set of predictors.

Several cautions concerning the interpretation of stepwise multiple regression should be mentioned. One assumption of the multiple regression model is perfect measurement in the predictor variables, i.e., no error of measurement in the data. In the present case, since measurement error definitely exists, the obtained regression coefficients are conservative estimates of the true values.

A second factor that may have affected the calculated regression results was the method of handling missing data. The mean value of the sample was substituted for the missing values, for those variables where the mean was an interpretable statistic. This procedure tends to reduce further the magnitude of the calculated regression coefficients, and makes the estimation procedure even more conservative.

While these two factors tend to make regression results underestimates of any underlying relationships, other limitations of the stepwise regression technique may have the opposite effect. For example, the predictor variables selected in the regression steps, and the order of those steps, are a function of the complete set of correlations among the variables; any spuriously high correlations that occurs in an early stage of the stepwise procedure may become magnified in later steps, thereby producing apparently strong regressions that actually reflect measurement or sampling errors. Therefore, no single analysis (or study) can give conclusive evidence for the existence or the non-existence of a relationship. A given result can be established only by confirmation of the result through independent studies. While these limitations are true to some degree for all types of studies and all types of analytic techniques, they are more serious when, as in the present case, stepwise regression is used with non-experimental data. An ameliorating factor in the analyses reported here, however, is that each analysis is repeated on several samples; within the target universe of the study, those samples are independent. A consistency of results across such samples, therefore, could furnish some supporting evidence. For this reason, most of the analyses reported in this chapter are concerned with patterns of relationships found in different samples or subsamples, rather than with isolated instances of such relationships.

In interpreting the results of a stepwise regression analysis, a related problem must be kept in mind: the final equation may contain only a small fraction of the potential predictors examined by the procedure. In such instances, the usual interpretation of statistical significance may be distorted, since the statistics do not take into account the total numbers of potential predictors. Again, only through a repetition of studies can a particular result be confirmed.

b. Results

Results of the Year Three cross-sectional analyses of achievement outcomes are presented in Appendices VII-A through VII-T. For each analysis, a separate table is provided for each combination of outcome measure and evaluation sample. Individual tables give the derived regression statistics for each analysis subgroup within grade level. Values of the Beta coefficient are shown for all cases in which the F-ratio was greater than 3.90 in the final regression equation. Since the dependent measure was in the form of a residual score, the relative contribution of a particular variable to the prediction of the outcome measure is roughly indicated by the size of the Beta weight associated with that variable.

The discussion that follows summarizes patterns of significant relationships between independent variables and outcomes, where those patterns show some consistency across grade levels and dependent variables. Significance levels are not indicated in the discussion of specific relationships, since all Beta values satisfied the criterion specified above ($F < 3.90$).

The results of analyses that used individual students as the unit of analysis and that focused on achievement outcome measures are presented in the following paragraphs. These results are organized into three subsections: the first discusses program variables found significantly associated with achievement in Year Two; the second, program variables for which data were collected at the student level; and the third, certain teacher variables for which data were collected in Year Three. (The names and descriptions of the variables used in these three sets of analyses are given in Appendices VII-U, VII-W, and VII-Y, respectively.) A fourth subsection presents the results of the school-level analyses of critical mass.

(1) Analyses of Variables Previously Found Related to Achievement

(a) Elementary Samples. Analyses attempting to predict reading outcomes from the set of predictors found meaningfully related in Year Two analyses showed only two consistent patterns for the Basic and Pilot Elementary samples. First, schools with larger per-pupil expenditures tended to have larger reading gains. Both elementary samples showed a significant positive relationship between total per-pupil expenditures and residualized reading posttest scores in grade 4, and between total supplemental per-pupil expenditures and residualized scores in grade 3. There was also a negative relationship in the Pilot sample (grade 4) between residualized reading posttests and the size of supplemental expenditures for math instruction, and a smaller relationship at grades 3 and 4 for the Basic sample; this finding may reflect a competition, between reading and math programs, for limited resources.

Second, a negative relationship was found in the Basic sample between the extent of school and district activities designed to support and facilitate desegregation, and the magnitude of reading gains. (Analysis of such relationships for Pilot schools would be somewhat meaningless, since Pilot schools were by definition minority-isolated.) Specifically, the Basic Elementary sample showed a significant negative association between desegregation-related activities and residualized reading posttest scores at grades 4 and 5. This finding is surprising, as it reverses the positive relationship found in Year One between desegregation-related activities and achievement. However, the explanation may be the amount of time the schools had been desegregated. In Year One, desegregation had been fairly recent in many Basic Elementary schools; in that same year, a positive relationship was found between desegregation-related activities and achievement. In Year Two, no interpretable pattern of relationships was found between the two variables. Finally, in Year Three, when most of the sample schools had been desegregated for several years, the relationship became negative. It seems quite possible that desegregation-related activities in Year One represented positive district and school attitudes toward desegregation, whereas, by Year Three, only schools with severe integration problems--problems that could adversely affect achievement--were still devoting an appreciable effort to the direct support of desegregation.

Pilot sample results for the mathematics outcomes closely paralleled those for reading. In particular, residualized math posttest scores had a significant positive association with total per-pupil expenditures at the third and fourth grades, while a similar relationship was found with supplemental per-pupil expenditures at the third grade. No interpretable patterns of relationships involving funding levels were found in the Basic Elementary sample.

Like the reading scores, mathematics scores (residualized posttests) for the Basic Elementary sample showed a negative association with desegregation-related activities, but the strength of the relationship was considerably lower for mathematics. Again, a possible interpretation is that by Year Three, intensive desegregation-supporting activities were the districts' responses to disruptive integration problems in certain schools.

An additional pattern emerged when the results for the three Pilot grades and the three Basic Elementary grades for both reading and mathematics were examined together. For all samples and outcomes, the regressions showed higher predictive power for the third grade than for the fourth or fifth grade.

(b) Secondary Sample. Results for this sample showed only one set of interpretable findings: desegregation-related activities were positively associated with reading outcomes (residualized posttest scores), particularly at the twelfth-grade level. These results tend to confirm the Year Two findings, which also revealed positive patterns of association for this sample. At the same time, however, the Year Three data appear to contradict the rationale presented above for the Basic Elementary sample's negative relationship between desegregation-related activities and achievement. A possible explanation is that the secondary schools had not undertaken full desegregation as early as the elementary schools, so that desegregation-related activities at the secondary level in Year Three might still have been affirmative actions rather than reactions to crises. Such an explanation is purely conjecture at this point, however, as the data on desegregation status were unfortunately not recorded separately for elementary and secondary schools within a district.

(2) Analyses of Student-Level Variables

This subsection discusses the results of analyses focusing on potential predictor variables that were expected to vary considerably among students within a classroom. Such relationships, if found, might indicate variables that would moderate the effectiveness of classroom or school program features. The tables of regression statistics resulting from these analyses were given in Appendices VII-G through VII-M.

(a) Elementary Samples. No strong patterns of results were found in reading outcomes for the Basic or Pilot Elementary samples. A weak negative relationship was found, primarily for the Pilot schools, between reading outcomes and the frequency of pullout remedial instruction; that is, residual reading posttest scores were lower in schools that made more frequent use of such pullout activities. A likely explanation is that certain schools used more pullout remediation because they had students with particularly severe learning problems.

In the Basic Elementary sample, reading outcomes were higher for schools that made more frequent use of independent student seat work; this relationship was fairly weak, however. A much stronger relationship, found in both the Basic and Pilot Elementary samples, was a positive association between residual reading posttest scores and the students' expectations for the amount of schooling they would complete. The causal relationship (if any) between expectations and achievement in this case is unclear, but the most probable explanation is that the students' expectations were shaped by their past experiences of academic success or failure.

Analyses relating student-level variables to the mathematics outcomes produced one meaningful pattern of relationships. Residualized math posttest scores were higher in schools giving more hours of math instruction each week. Significant positive coefficients were found between math instructional hours and residualized posttest scores at the third and fourth grades for both the Basic and Pilot Elementary samples. As with reading, the mathematics outcomes showed a positive association, for both Basic and Pilot Elementary samples, with the students' expectations for future educational attainments. Again, the possible direction of any causal relationship that may have existed between expectations and achievement is uncertain.

The tendency for the third-grade analyses to show greater predictive power than those for other grades was again evident. In each of the four sets of analyses (Pilot and Basic, reading and math), the proportion of variance accounted for was highest for the third-grade samples. This finding may indicate a greater effectiveness of the programs at the earlier grade levels.

(b) Secondary Sample. Only one interpretable pattern of results was found in the analyses of student-level variables in the Basic Secondary sample. The students' views of their control over the environment, as measured by the "locus of control" scale, was positively associated with both reading and mathematics outcomes. That is, students who felt they had more control over their environment and destiny tended to have higher residualized posttest scores. The direction of causality (if any) between perceived locus of control and achievement cannot be established on the basis of available data. Nevertheless, the finding of a relationship between the two variables is potentially important, for two reasons. First, it appears to provide some evidence that locus of control is a meaningful dimension of student affect and attitudes, and one that may help to predict student achievement. Second, though causality cannot be demonstrated directly, it seems quite possible that the students' perceptions regarding locus of control may have influenced their school performance. If so, those perceptions might be shaped beneficially by school policies. For example, the students might be given more control over certain aspects of their curricula and instructional materials. In short, it is possible that appropriate use of manipulable program variables might improve student attitudes related to locus of control, and those attitudes might, in turn, help to improve the students' academic achievement.

(3) Analyses of New Teacher Variables

The new teacher questionnaire items related to reading and mathematics instruction were subjected to several analyses. While the items seemed to have a high degree of face validity and did group into generally interpretable clusters, the items and clusters did not show any consistent pattern of association with any of the outcome measures. The regression coefficients obtained for the analyses of the individual items are reported in Appendices VII-N through VII-T. Examination of the correlations of these teacher items with the outcome measures reveals that few of the items yielded even a moderate correlation with either the pretest or the posttest scores, and even fewer items had any significant correlation with the residualized posttest scores.

(4) School-Level Analyses of Critical Mass

An earlier part of this chapter (Section A.1.b) presented results of student-level regression analyses that examined several program variables, including per-pupil expenditures, in relation to achievement. Those analyses revealed, for certain combinations of evaluation sample, grade level, and outcome, statistically significant associations between larger per-pupil expenditures and larger student achievement gains. This subsection also examines relationships between school expenditures and achievement outcomes, but uses school-level analyses, and approaches the expenditure issue from a different perspective. Specifically, the analyses discussed here represent an attempt to confirm the results of the Year Two "critical mass" analyses, using Year Three data.

Critical mass has been defined for the purposes of this study as "the minimum supplemental expenditures necessary to ensure some measure of program success." The concept of critical mass assumes a discontinuity in the relationship between expenditure level and achievement gain, such that beyond the point of discontinuity, achievement gains are larger per unit cost. Tentative evidence of such a discontinuity was found in the analysis of the Year Two data for the Pilot Elementary and Basic Elementary samples. Schools that had total per-pupil expenditures of more than $1400 or regular per-pupil expenditures of more than $1200 were found to have significantly higher ($p < .05$) reading and mathematics gains than those that spent less than these amounts. No such relationship was found in the Basic Secondary sample, and that sample was not examined further in the Year Three analyses discussed here.

The following paragraphs discuss first, the data source and methodology of the attempt to confirm last year's evidence of critical mass, and then, the results of these analyses.

(a) Methodology. Expenditure data were derived from information provided on the School Business Manager Questionnaire. These data were used to calculate per-pupil expenditures for ESAA-participating (treatment) and ESAA-eligible (control) students. (A detailed discussion of these procedures is given in Chapter V.) The achievement measures were the differences between Year Three pretest and posttest standard scores, aggregated to the school level.

Because funding levels (other than ESAA) were not established in schools by randomized assignment procedures, the analyses of relationships between funding and achievement were exploratory rather than confirmatory (experimental) in nature. The first form of analysis involved visual inspection of scatterplots of achievement gain by expenditure level, with schools as the unit of analysis. Types of per-pupil expenditures examined included total, regular, total supplemental, ESAA, and non-ESAA supplemental expenditures. None of the scatterplots for the two samples examined (Basic Elementary and Pilot

Elementary) showed any consistent relationship between funding and achievement gains. In particular, there was no discontinuity in any of the plots that could be interpreted as indicating a critical mass. Thus, in Year Three, the graphic analysis procedures yielded no confirmatory support for trends found in the Year Two data.

Next, three groups of schools (high-, medium-, and low-expenditure) were defined within each elementary sample for each funding variable (i.e., total, regular, total supplemental, and ESAA per-pupil expenditures). Actual dollar ranges of the three expenditure groups for each funding category were defined on the basis of preliminary analyses, so as to maximize whatever relationship might exist between achievement gain and expenditure level. The same classification levels were used for both Pilot and Basic Elementary samples, in order to determine the extent of generalizability of critical mass findings. Unfortunately, the dollar ranges defining the three expenditure groups were quite broad. A larger number of groups, each covering a small expenditure range, might have been helpful in delineating the relationships more precisely, but the numbers of sample schools were too small to permit such a procedure.

The analytic technique used for reaching inferences about critical mass was a one-way analysis-of-variance model with contrasts. It was hypothesized that statistically significant overall variations in mean achievement gain would be found across the different expenditure groups in both reading and mathematics. It was further hypothesized, based on Year Two findings, that no statistically significant difference would be found between the performance of the low- and medium-expenditure groups, and that a significant difference would be found between the high-expenditure group and the pooled low and medium groups. Such results, if found, might be interpreted as supporting the Year Two findings, and would suggest a critical mass (discontinuity) somewhere between the means of the medium- and high-expenditure ranges.

(b) Results. Tables VII-3 and VII-4 show analysis-of-variance results for the Basic Elementary and Pilot Elementary samples, respectively. Each table entry represents the mean achievement gain in reading or math for the particular expenditure category and expenditure group indicated; the figures in parentheses are the corresponding standard deviations. The right-hand column of each table indicates the probability level associated with the F-ratio for each expenditure category. Actual dollar ranges for the low-, medium-, and high-expenditure groups vary with expenditure category, and are specified in Appendix VII-Z.

As shown in the tables, only two of the expenditure categories had significant variances (i.e., F-ratios with probabilities less than .05), and these were both in the Basic Elementary sample. Specifically, significant variances were found among the reading gains for schools with different levels of total per-pupil expenditures, and among the mathematics gains for schools with different levels of total supplemental per-pupil expenditures. However, neither of these cases is easily interpretable; achievement gains, rather than increasing systematically with higher expenditures, instead reached an apparent peak at the medium-expenditure level and then decreased at the high-expenditure level. Such a relationship corresponds neither with the critical mass hypotheses presented in this chapter, nor with the Year Two findings; further, it does not seem logical that adding to expenditures beyond a certain level would be detrimental to student learning.

A possible explanation for these seemingly anomalous findings can be found in the Basic Elementary sample's achievement data for different levels of regular and ESAA per-pupil expenditures (Table VII-3). In both reading and mathematics, achievement gains systematically decreased with higher per-pupil levels of regular expenditures, and increased with increasing levels of ESAA expenditures. Thus, it may be conjectured that the two types of funding, as major components of the total per-pupil funding figures, created the peak of achievement gains for the medium value of total expenditures. However, neither trend involving

TABLE VII-3. BASIC ELEMENTARY SAMPLE: COMPARISON OF ACHIEVEMENT GAINS FOR SCHOOLS HAVING DIFFERENT EXPENDITURE LEVELS*

Area	Expenditure Category	Expenditure Group**			F-Ratio Probability (d.f.=2,39)
		Low	Medium	High	
Reading	Total Per-Pupil	30.47(9.78)	39.83(14.61)	27.47(8.02)	.02
	Regular	35.96(14.49)	30.93(10.33)	26.89(6.01)	.16
	Total Supplemental	29.54(9.59)	36.83(15.81)	34.45(13.25)	.30
	ESAA	29.76(7.92)	30.44(15.45)	37.07(16.22)	.23
Mathematics	Total Per-Pupil	48.49(13.95)	52.12(16.36)	40.99(9.25)	.10
	Regular	48.83(18.16)	47.24(12.52)	42.61(8.33)	.55
	Total Supplemental	44.52(10.38)	67.60(19.37)	43.99(12.75)	.003
	ESAA	44.89(11.10)	46.54(9.95)	51.90(20.62)	.41

TABLE VII-4. PILOT ELEMENTARY SAMPLE: COMPARISON OF ACHIEVEMENT GAINS FOR SCHOOLS HAVING DIFFERENT EXPENDITURE LEVELS*

Area	Expenditure Category	Expenditure Group**			F-Ratio Probability (d.f.=2,23)
		Low	Medium	High	
Reading	Total Per-Pupil	23.52(9.30)	31.21(14.61)	31.55(12.39)	.26
	Regular	28.58(13.84)	27.65(7.27)	24.60(7.92)	.90
	Total Supplemental	26.50(8.12)	24.39(14.35)	30.76(12.40)	.52
	ESAA	26.70(7.92)	25.89(13.39)	31.53(13.48)	.58
Mathematics	Total Per-Pupil	30.84(14.90)	41.20(10.82)	45.49(11.20)	.06
	Regular	35.59(14.27)	40.03(8.63)	57.10(13.29)	.10
	Total Supplemental	39.08(8.19)	30.79(18.75)	41.65(12.57)	.26
	ESAA	43.37(12.53)	37.12(12.34)	35.19(16.93)	.51

*Table entries represent mean achievement gains, with standard deviations in parentheses.

**Actual dollar ranges for these expenditure groups are shown in Appendix VII-Z.

regular and ESAA expenditures was statistically significant. Furthermore, the negative relationship between regular funding and achievement gains, if more than a chance occurrence, is difficult to explain. The only conclusions that seem justified at this point are that (1) there is no evidence in the Year Three data on total per-pupil funding to support the critical mass finding reported in Year Two, and (2) there are consistent but non-significant indications, within the Basic Elementary sample, that regular and ESAA expenditures may have opposite relationships with achievement gains.

B. LONGITUDINAL ANALYSES

An important feature in the design of the ESAA study was the collection of longitudinal data for a sample of the ESAA students. While gains within a school year may indicate the short-term effects of instructional programs and school components, it was felt that measures of student achievement over a longer period would yield more stable estimates of both the instructional outcomes and the relationship of school and student inputs to those outcomes. Toward this end, a set of longitudinal analyses was planned in which discriminant analysis techniques would be used to examine differences between students who were consistently superior to other sample students in achievement gains, and students who were consistently less successful. It was hoped that certain manipulable program variables might be found systematically related to those differences.

The first step in the planned analyses was to examine each student's ESAA scale scores and percentile ranks on the achievement test for each of the six data points (i.e., pretest and posttest administrations in Years One, Two, and Three). An attempt was then made to define a set of students whose achievement gains were consistently among the largest in the sample, and another set whose achievement gains were consistently among the smallest in the sample. Unfortunately, only a small percentage of the longitudinal sample students were consistently successful or consistently unsuccessful over the three years of the study. A student who was among the biggest gainers one year might be only an average or poor gainer the next year. Thus, without making the criteria for membership in the "consistently successful" or "consistently unsuccessful" group so lax as to be meaningless, it was not possible to form groups with adequate sample sizes. Some preliminary efforts were made to define groups by softening the degree of consistency required, but as expected, analyses using such groups showed no interpretable relationships between group membership and any of the potential predictor variables.

C. SUMMARY

Multivariate analyses were conducted to identify combinations of school, staff, and program factors associated with student outcomes. These analyses were exploratory in nature; hence, inferences from their results have less generalizability than do inferences from the results of the experimentally based impact analyses of Chapter VI. Furthermore, although the reported results reflect patterns rather than isolated findings, few relationships were found in all of the subsamples. For these reasons, results reported here should be interpreted with some caution. The major findings of the cross-sectional analyses were as follows:

- As in Year Two, there was some evidence of better achievement in schools with higher expenditure levels, although there was no evidence of any specific funding level at which programs improved dramatically; i.e., no "critical mass" was identified. In general, Basic and Pilot elementary schools with higher per-pupil total expenditures and those with higher supplemental expenditures tended to have students with higher reading achievement. Furthermore, higher mathematics achievement was found in schools with larger per-pupil total expenditures.
- Also corroborating Year Two findings was a positive relationship in the Year Three Basic Secondary sample between students' reading achievement and the extent of school activities designed to promote a favorable interracial climate (e.g., parent-teacher discussions, use of media to disseminate information about interracial plans and activities).

Surprisingly, however, a negative relationship was found in the Basic Elementary sample between such activities and student achievement. A possible explanation is that since most Basic Elementary sample schools were almost completely desegregated before ESAA was created, the only elementary schools still finding it necessary in Year Three to devote much effort to the active promotion of interracial harmony were schools with substantial and disruptive racial strife. Secondary schools, by contrast, may have been desegregated somewhat more slowly; in such a case, desegregation-supporting school activities in Year Three may still have represented a positive and affirmative action rather than simply a reaction to obvious disharmony.

- Both the Basic and Pilot Elementary samples showed a clear positive association between the number of hours the students spent in mathematics instruction and the students' residualized mathematics posttest scores.
- Within the Basic Elementary sample, students who perceived themselves as having a greater degree of control over their own environment and destiny tended to have higher achievement in reading and mathematics. Although the direction of causality (if any) between these perceptions and achievement cannot be determined in the present study, it seems possible that procedures to enhance student feelings of control might be built into future programs (e.g., by giving students some voice in selection of materials) and that those feelings might have beneficial effects on achievement.

CHAPTER VIII

SUMMARY

This report presents the evaluation findings for the third year of implementation of the Emergency School Aid Act (ESAA) program, 1975-76.* Although it relates some of these findings to evaluation data for the two preceding years, it does not represent an overview of results for the entire three years; that overview will be provided in a separate report, to be released in the summer of 1977.

As in previous reports, the evaluation described here does not cover all subprograms funded under the Emergency School Aid Act, but is limited to the Basic and Pilot Grant programs; those two programs, however, account for approximately four-fifths of the total ESAA expenditures. Basic Grants are awarded to eligible school districts to help reduce minority-group isolation, to meet special needs incident to the elimination of segregation and discrimination, and to assist elementary- and secondary-school children in overcoming the educational disadvantages associated with past or present minority-group isolation. Pilot Project Grants are awarded to districts for unusually promising projects designed to overcome the adverse effects of minority-group isolation by improving the academic achievement of children in minority-isolated schools.

The outcome variables of major concern in this report are measures of student performance on standardized achievement tests in reading and mathematics. Data were also collected on changes in student perceptions of race-related school climate (e.g., perceived discrimination in the school, student liking for school), using a School Climate Questionnaire prepared for that purpose by a special advisory panel. However, because the School Climate Questionnaire was found to have fairly poor psychometric characteristics (e.g., low inter-item correlations), the data from that instrument are used primarily for descriptive purposes, and little emphasis is placed upon their application as outcome measures that might reflect ESAA program impact.

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*Earlier reports include:

The First Year of Emergency School Aid Act (ESAA) Implementation. System Development Corporation, TM-5236/008/00, September 1975.

The Second Year of Emergency School Aid Act (ESAA) Implementation. System Development Corporation, TM-5236/009/00, July 1976.

An In-Depth Study of Emergency School Aid Act (ESAA) Schools: 1974-75. System Development Corporation, TM-5236/010/00, July 1976.

National Evaluation of the Emergency School Aid Act (ESAA): Summary of the Second-Year Studies. System Development Corporation, TM-5236/011/00, July 1976.

As in Year Two, it was found impractical to use reduction in minority-group isolation as an outcome measure for the third-year analyses. Almost all sample districts had achieved a high level of racial balance* well before the 1975-76 school year; thus, it would have been unreasonable to expect significant further improvement in that balance that might be attributed to ESAA.

The Year Three evaluation data have at least two important advantages over the preceding year's data. First, only in Year Three were achievement data available for the same group of students (the longitudinal cohort) over a full three-year period. Using these data, achievement growth trends over six consecutive test administrations (pretest and posttest in each of the three years) were examined for possible evidence of cumulative program impact on the students. Temporal changes in the test scores of the three years' cross-sectional samples were also studied, to determine whether the sample ESAA projects became more effective over successive years.

Another major advantage of the Year Three analyses over previous years was that for the first time, data were collected on the degree of overlap among the students receiving services under different types of compensatory education programs. This information made it possible to compute more realistic estimates of the total per-pupil expenditures for sample students than had been available previously.

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*It is important to note that the district-level measure of desegregation (racial balance) available for this study simply indicates to what extent the racial/ethnic proportions for individual schools in a district matched the proportions in the district as a whole. Thus, the measure says nothing about the quality of interracial attitudes or cooperation (i.e., degree of integration) within schools.

One disadvantage of the third-year study was that sample attrition had severely reduced the sizes of the Year Three Basic Secondary and Pilot Elementary school samples--so severely, in fact, that statistically significant evidence of program impact for those samples would be quite difficult to detect. For this reason, the major emphasis in the present report is on impact and relational analyses using data from the Basic Elementary sample.

The remainder of this chapter first summarizes some of the most relevant characteristics of the sample districts and schools, including the racial/ethnic composition of their staffs and student bodies. Descriptive data on the backgrounds and needs of sample students are then presented, followed by information on funding allocations and other program characteristics in the sample districts and schools. Finally, analyses of the sample students' gains in achievement test scores, and of relationships between those gains and various program characteristics, are discussed.

A. CHARACTERISTICS OF SAMPLE SCHOOLS AND DISTRICTS

The Year Three cross-sectional samples (treatment plus control schools) included 48 Basic Elementary schools, 28 Basic Secondary schools, and 30 Pilot Elementary schools, in 54 ESAA-funded school districts. Posttest data were available for a total of 9,541 students. The longitudinal sample (districts, schools, and students in the samples for all three years) included 34 Basic Elementary schools, 16 Basic Secondary schools, and 16 Pilot Elementary schools in 32 ESAA-funded districts (a total of 1,383 students for whom complete achievement data over the three years were available). Much of the difference in sizes of the cross-sectional and longitudinal samples results from the fact that the longitudinal samples were limited to students in the fifth and twelfth grades in Year Three (i.e., students still remaining from the first year's third- and tenth-grade samples), whereas the cross-sectional samples included replacement students, and consisted of students from grades 3 through 5, and 10 through 12.

At the district and school levels, Year Three cross-sectional samples contained only the carry-overs from the previous year's samples; that is, there were no district or school replacements, although student replacements were drawn to maintain adequate size in the Year Three cross-sectional samples and to provide new third- and tenth-grade samples. Because there was no random sampling of districts or schools from the lists of ESAA awardees in 1975-76, and because virtually no data were available on demographic characteristics of the total 1975-76 ESAA award universe, it is impossible to determine with any certainty how representative the Year Three samples were of their respective award universes. Barring dramatic changes in the character of districts newly funded by ESAA in 1975-76 (and there is little evidence of such changes in the grant review guidelines), it seems likely that the Year Three cross-sectional samples were, as in previous years, fairly representative of the award universe, except for the tendency, noted in earlier reports, for the sample districts to be larger, on the average, than the universe of ESAA-funded districts.

Analyses were performed on several demographic characteristics of the longitudinal samples, to determine whether there were differential attrition effects over the three evaluation years that might have produced bias or unrepresentativeness in those samples. Overall, the longitudinal cohorts provided little evidence of differential attrition that might bias longitudinal comparisons between the treatment and control groups. Furthermore, the longitudinal groups in general, while unique in their stability, seem to be representative samples of students defined by the Year One sample selection criteria, and as such provide useful data on academic growth over time for this evaluation and for similar studies of disadvantaged students.

For all three of the Year Three cross-sectional samples, more than half the districts were from HEW Regions IV (Southwest) and VI (South Central). This same concentration of districts in southern regions also occurred in the Year Three ESAA award universes and in the previous years' evaluation samples. Although there were some percentage shifts in geographic distributions between Years Two and Three, the size and pattern of those shifts do not suggest a major qualitative change in the makeup of the districts being studied.

The median percentages of minority students in Year Three sample districts were 33 percent for the Basic Elementary sample, only 25 percent for the Basic Secondary sample, and over 75 percent for the Pilot Elementary sample. Black students constituted by far the largest minority group in the sample districts, with

Spanish-background students the second largest group. As in previous years, percentages of minority staff members were correlated with, but consistently lower than, the corresponding percentages of minority students.

All three school samples had substantial numbers of disadvantaged students, as indicated by the percentages of students judged eligible for ESEA Title I services. The largest percentage of such students was found in Pilot Elementary schools (65 percent); the corresponding percentages for the Basic Elementary and Basic Secondary samples were 43 percent and 23 percent, respectively.

Median values of districts' average daily attendance were 13,000 for the Year Three Basic Elementary sample, over 32,000 for the Basic Secondary sample, and almost 9,000 for the Pilot Elementary sample. Average school enrollments for those three samples were 545, 1,579, and 628, respectively.

There were no statistically significant differences between the paired treatment and control schools in any of the three evaluation samples, with respect to student or staff racial/ethnic composition, percentage of ESEA Title I-eligible students, or school enrollments. These findings are consistent with the study's impact analysis design, which assumes equivalence of the treatment and control groups on dimensions other than those associated with the award or denial of ESAA funds.

B. STUDENT BACKGROUND AND NEEDS

Slightly more than half the students in the Basic Elementary sample were White, another two-fifths were Black, and around six percent were Spanish-background. At the secondary level, White students constituted about 58 percent of the Basic sample; Black students, about 37 percent; and Spanish-background students, almost 5 percent. As in previous years, the Pilot sample was most heavily minority-concentrated; more than half the sample students were Black, and more than a fourth were Spanish-background. In none of the three samples were there substantial percentages of other racial/ethnic groups, though the Pilot Elementary sample did contain almost four percent American Indians.

An acute need for compensatory education services was again apparent among sample students in Year Three, as in previous evaluation years. Pretest mean achievement percentile ranks (for all racial/ethnic groups combined) ranged from the 17th through the 35th percentile. Percentile scores were generally higher in reading than in math, and were somewhat higher for non-minority than for minority students. Overall, these results appear to indicate that the ESAA grant award process led to the funding of needy districts and schools, and that schools selected needy students to participate in the local ESAA programs.

There was also evidence of socioeconomic disadvantage among sample students. About three-fourths of the Basic sample students' parents and only about half the Pilot students' parents were reported by the students' teachers to have completed high school. The percentage of fathers holding jobs in the service or labor category (the lowest of three categories used) was around 49 percent for the Basic Elementary sample, 39 percent for the Basic Secondary sample, and 70 percent for the Pilot Elementary sample. Non-minority parents generally had more professional jobs, more education, and higher socioeconomic status than did minority parents.

In both the Basic and Pilot Elementary samples, minority students tended to have less favorable perceptions than did non-minority students of their interactions with and treatment by school principals. There also was some evidence that the students' perceived treatment by principals was more favorable in Basic (desegregated) schools than in Pilot (minority-isolated) schools. Minority students in Basic Secondary schools perceived much more racial discrimination in the schools than did non-minority students. On the other hand, minority students perceived more extensive interactions among different racial/ethnic groups than did White students.

The Pilot sample showed no evidence of systematic differences among sample students in the treatment (ESAA-funded) and control (non-ESAA-funded) schools, with respect to initial (pretest) scores on achievement tests or to other student and family characteristics. However, in the Basic Elementary and Secondary samples, the control schools tended to have pretest scores higher than those of the treatment schools. Although few of the treatment-control differences were statistically significant, the consistency of direction of the differences seemed to indicate more than chance variations. Further, the direction of differences suggested that subsequent treatment-control comparisons of gains in test scores might tend to underestimate the relative achievement of the treatment group. For this reason, in the analyses of ESAA program impact, treatment-control comparisons were performed both with and without adjustments for differences in pretest scores.

C. FUNDING PATTERNS

Data on school expenditures were particularly critical in this study, as the allocation of ESAA funds was the only program variable directly manipulated for evaluation purposes. The evaluation design originally assumed that treatment and control schools would receive equal funding from regular district sources and from non-ESAA supplemental program sources, and that only treatment schools would receive ESAA funds. Thus, the total per-pupil funding in treatment schools should have been greater than that in control schools by the amount of the treatment schools' per-pupil ESAA funding. However, data from the first two evaluation years indicated that some districts might be giving more non-ESAA supplemental money to certain control schools than to their paired treatment schools, perhaps to "compensate" for the denial of ESAA funds to the control schools. In addition, a small number of control schools received ESAA funds, usually for grades not involved in the study, by agreement with USOE. (Such compromises were occasionally necessary in order to maintain the size of the longitudinal samples, especially in the case of the Basic Secondary and Pilot Elementary samples, which were already quite small.) The extent of the deviations in funding patterns from the original design assumptions could not be determined precisely in Years One and Two, because funding data were available only for entire schools, rather than for the sample students in particular. In Year Three, data were collected on the percentage of ESAA participants (or ESAA-eligible students, in the case of control schools) receiving funds from each source of supplemental expenditures. This information, in combination with total expenditure figures and data on the number of ESAA-participating (or ESAA-eligible) students in each school, permitted calculations of meaningful per-pupil expenditure estimates for the populations of disadvantaged students from which the evaluation samples were drawn.

These improved calculation procedures revealed that Year Three per-pupil ESAA expenditures in Basic Elementary treatment schools averaged over $320, while in control schools they averaged only $34. In Basic Secondary schools, however, the treatment-control difference in ESAA funding ($91 per pupil in treatment schools, $32 in control schools) was much reduced, and in the Pilot sample, ESAA funding in the control schools ($168 per pupil) was over half as large as that in the treatment schools ($329).

Per-pupil non-ESAA supplemental expenditures for the Basic Elementary sample were substantially larger in treatment schools ($196) than in control schools ($95); in this sample, a considerable effort was apparently made to focus discretionary funds of all categories on the treatment schools. By contrast, non-ESAA supplemental funds in Basic Secondary schools, both treatment and control, were negligible. In the Pilot sample, control schools received more non-ESAA supplemental funding ($130 per pupil) than did treatment schools ($91); this finding may indicate an attempt by Pilot districts to "compensate" for ESAA funds denied to the control schools.

Total per-pupil expenditures for the Basic Elementary sample were significantly higher in treatment schools ($1,549) than in control schools ($1,169). In the Basic Secondary and Pilot Elementary samples, although the funding differences favored the treatment schools, the differences were not statistically significant. Thus, only in the Basic Elementary sample was there a clear-cut treatment-control funding distinction of the type originally assumed in the study's experimental design.

More than half the total supplemental funds in all three evaluation samples were spent for basic skills instruction. Only the Basic Elementary sample showed significant treatment-control differences (favoring treatment schools) in actual dollar allocations and in the percentages of funds allocated for activities having logical relationships to the outcome measures. Specifically, in this sample, treatment schools spent more supplemental funds than did control schools for reading and math instruction, and for intergroup and cultural enrichment activities.

As in Year Two, all three samples showed greater regular and total per-pupil expenditure levels in schools with higher achievement pretest scores. However, in contrast with the Year Two findings, the Basic Elementary sample in Year Three also showed higher supplemental per-pupil expenditures in schools with higher pretest scores. Thus, the Basic Elementary sample data for Year Three failed to support the earlier findings of targeting of supplemental funds toward schools with the greatest academic needs; this change in direction of relationships between need and expenditures does not appear to be a function of school-level sample changes between Years Two and Three, but could conceivably reflect student-level changes. Both the Basic Secondary and Pilot Elementary samples showed a general pattern of higher supplemental per-pupil expenditures in schools with greater academic need (i.e., lower pretest scores), but the correlations between those measures were not statistically significant.

D. PROGRAM RESOURCES AND SERVICES

Over 80 percent of the remedial reading teachers in each sample had participated in inservice training programs. By comparison, only about half the remedial math teachers in the Pilot Elementary and Basic Secondary samples, and about 75 percent of those in the Basic Elementary sample, had participated in such training. Across all samples, approximately half the regular classroom teachers in both reading and mathematics had received inservice training. Overall, a third of the Basic sample teachers had received training in cultural enrichment or intergroup relations; such training was found at the secondary level to be associated with the more positive teacher perceptions of the effects of desegregation.

Remedial teachers in all samples reported that paid paraprofessionals and aides were the categories of auxiliary personnel most often available to help them in the classrooms. On the average, remedial reading teachers in all samples, and remedial math teachers in the Pilot sample, received about three hours of assistance from such auxiliary personnel each week, while remedial math teachers in the Basic samples received only about one hour of help weekly. About a fifth of all teachers reported parent and student participation in school-related needs assessment activities, but few reported such participation in program planning, development, or evaluation.

Most regular classes had between 21 and 30 students, while remedial classes usually ranged from 11 to 20 students. The lowest student-teacher ratios were found in the Basic Elementary sample, where the percentage of classes with over 30 students was only half that in the Pilot Elementary sample.

Elementary students spent about two hours per day in reading activities; secondary students in regular classes averaged about an hour per day in reading/English activities, and those in remedial classes averaged two hours. Across samples, approximately one hour each day was spent in mathematics instruction, and from five to ten minutes in testing and evaluation.

Approximately half the secondary students and three-fourths of the elementary students participated in cultural enrichment/intergroup relations activities. About 10 percent of the elementary students and 20 percent of the secondary students were involved in "English as a Second Language" activities.

The most clear-cut treatment-control differences in services and resources made available to students were found in the Basic Elementary sample. This finding is quite logical since, as noted in Section C, only that sample showed statistically significant advantages for the treatment schools in total per-pupil expenditures, and in per-pupil supplemental allocations for reading and math instruction and human relations activities. Specifically, in the Basic Elementary sample, regular (non-remedial) classrooms in treatment schools tended to have smaller numbers of students than those in control schools; this relationship was reversed in the Pilot sample. Furthermore, personnel allocations in the Basic Elementary sample indicated greater use in treatment schools than in control schools of auxiliary personnel (remedial specialists, instructional aides, and media specialists) for regular reading programs. The Pilot treatment schools also made significantly greater use of instructional aides, but not of the other auxiliary personnel categories. Thus, it appears that the higher funding level of the treatment schools, particularly in the Basic Elementary sample, was translated, at least in part, into smaller student-teacher ratios and greater use of auxiliary personnel.

E. PROGRAM IMPACT

Because the assessment of ESAA program impact has been such a central issue in the entire evaluation, it is important to review the assumptions underlying this study's impact analysis design, and to consider the extent to which those assumptions have been met. First, it was assumed that pairs of schools, matched as closely as possible on broad demographic characteristics such as racial/ethnic mix and socioeconomic status, would be selected from sample ESAA-funded districts, and that the members of each pair would be assigned randomly to treatment (ESAA-funded) and control (non-ESAA-funded) conditions; a corollary assumption was that treatment and control schools would not initially differ significantly on variables other than those directly associated with the award or denial of ESAA funds. Second, it was assumed that sample students would be randomly drawn, within sample schools and within grade levels of interest, from the pools of students designated as ESAA-participating (or ESAA-eligible, in the case of control schools). Third, it was assumed that the allocation of ESAA funds to treatment schools would result in a treatment-school advantage in total per-pupil expenditures for ESAA-participating students, approximately equal to the per-pupil amount of the ESAA awards in the treatment schools. Fourth, it was assumed that the treatment schools' advantage in total per-pupil expenditures would result in those schools' allocating larger per-pupil sums than the control schools for activities relevant to the study's outcome measures (e.g., basic skills instruction, interracial activities). Fifth, reflecting the differential funding allocations in the treatment and control schools, it was assumed that greater services and resources would be provided for the treatment (ESAA-participating) students. Finally, it was hypothesized that the greater availability of funds and of pertinent services and resources in the treatment schools would lead to superior outcomes (e.g., larger achievement gains) in those schools. To the extent that the five assumptions might be met, a comparison of outcomes for the treatment and control schools would provide a suitable test of the hypothesized ESAA program impact.

How well were the study's assumptions actually met? The answer depends to some extent on the evaluation year and on the particular evaluation sample being examined. For example, in Year One, all sample schools were randomly assigned, by pairs, to treatment and control conditions, and all sample students were randomly selected, within sample school and within grade level, from the pools of ESAA-participating or ESAA-eligible students. In Year Two, all replacement schools and students were selected by these same procedures. In Year Three, replacement students were selected in this manner, but there were no replacement schools, as all the sample schools were carry-overs from the preceding year. Since the Year Three cross-sectional samples were not randomly assigned to treatment and control conditions at the beginning of that year, the school-level analyses of treatment-control differences in outcomes should be regarded as quasi-experimental rather than experimental in design. For the longitudinal samples, however, analyses of gains over the total three-year period still conform to the requirements of a true experimental design.

Even though the third-year cross-sectional sample schools were not randomly assigned to treatment and control conditions at the start of that year, the two groups of schools, and sample students in those schools, were reasonably well matched. As noted in earlier sections of this chapter, treatment-control comparisons revealed almost no statistically significant differences in demographic or socioeconomic characteristics. One exception to the overall similarity of treatment and control groups was that in the Basic Elementary and Secondary samples, control schools tended to have pretest scores higher than those of treatment schools, and a small number of these differences reached statistical significance. The direction of the differences suggests that the impact analyses might tend to produce underestimates of actual ESAA program effects.

With respect to the assumption of treatment-control differences in ESAA funding and, consequently, in total per-pupil expenditures, the Year Three data provide the clearest evidence, because of the more detailed data collected in that year and the improved methods used to calculate per-pupil supplemental expenditures (see Section C of this chapter). In Year Three, the Basic Elementary sample showed a statistically significant advantage for treatment schools in total per-pupil expenditures. This difference in total funding, moreover, exceeded the per-pupil level of ESAA funding in treatment schools, thus indicating that greater levels of other (non-ESAA) supplemental funds were also directed toward the treatment schools. By contrast, neither the Pilot Elementary nor the Basic Secondary sample showed significant treatment-control differences in total per-pupil expenditures. In part, this latter finding resulted from the fact that in order to maintain the size of the Basic Secondary and Pilot Elementary samples, some compromises were made that allowed the control schools to spend ESAA funds.

In other important respects, also, the basic assumptions of the study design were met much more closely in the Basic Elementary sample than in the other two evaluation samples. Only in the Basic Elementary sample did the treatment schools have larger per-pupil allocations for basic skills instruction and for human relations activities. Furthermore, treatment-school advantages in resources and services offered to students were almost entirely limited to the Basic Elementary sample.

In summary, although the Year Three cross-sectional samples did not fully meet the requirements of a true experimental design, the major assumptions underlying the ESAA impact analyses were reasonably well satisfied in that year by the Basic Elementary sample. The Year Three Basic Secondary and Pilot Elementary samples, on the other hand, failed to meet virtually all of the key assumptions. For this reason, and because of the marginal sizes of the latter two samples, it appears that only for the Basic Elementary sample were the treatment-control comparisons likely to provide a valid assessment of ESAA program impact in Year Three.

It is in this context of treatment-control program differences (or lack of differences, in the case of the Basic Secondary and Pilot Elementary samples) that the impact analysis results should be interpreted. Those results showed statistically significant evidence of positive ESAA program impact for the Basic Elementary sample in Year Three. For the six combinations of grade levels and student achievement measures[*] (reading and mathematics tests), five of the six treatment-control comparisons showed larger gains for the treatment schools in the Basic Elementary sample; two of those five differences (fifth-grade reading and fourth-grade math) were significant at the .05 probability level. By contrast, there was no strong evidence of program impact in the Basic Secondary or Pilot Elementary sample; as noted above, however, the treatment-control comparisons of outcomes for those samples probably did not provide a valid test of program impact, as the assumptions underlying those comparisons were not met.

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[*] Although school climate outcome data were also analyzed, little emphasis was placed on these analyses because of the poor psychometric properties of the school climate scales. Not only was there no evidence of program impact on school climate, but there was little variability in the scales between districts, or between pretest and posttest administrations in either treatment or control schools.

Several analyses were performed to determine possible reasons why the Basic Elementary sample showed ESAA program impact in Year Three but not in the prior years. No evidence was found for any selective "weeding out" or dropping out of less successful projects over the three years; attrition through discontinuation of local projects was similar for low- and high-achieving schools. There was some indication that the treatment schools' advantage in total per-pupil expenditures had increased each year, though much of the apparent increase in treatment-control funding differences was an artifact of the improved methods used for the first time in Year Three to calculate per-pupil expenditures. The best conjecture at this point is that the greater treatment effect (ESAA program impact) found for the Basic Elementary sample in Year Three resulted from a combination of an increasing advantage in school expenditures for treatment schools, and growing project effectiveness due to program maturation. The latter premise refers to the possibility that by the third year of ESAA operations, the sample projects might have completed many "start-up" activities, such as staff development and new curriculum design, thus enabling them to focus more effectively on their work with the students.

Our conjecture about program maturation effects, if correct, has an important implication for future evaluations of newly created social action programs such as ESAA. It is often useful to begin collecting program and outcome data in the first year of operations; in fact, much can be learned about important formative processes by collecting background and baseline data during the pre-operational planning and implementation phases. When it comes to impact evaluation, however, new programs should be given a reasonable period of time, probably at least three years in the case of large-scale programs, to demonstrate their effectiveness. Judgment of a program's value on the basis of first- or second-year data alone may well do a serious disservice, not only to those individuals and organizations operating the program, but also to administrators and legislative bodies that need to make policy decisions based on the evaluation findings.

Analyses were also performed on achievement data for the three-year longitudinal samples. Plots of the reading and math scores for the Basic and Pilot Elementary samples showed fairly consistent gains across the six data points for both treatment and control schools, whereas practically no gains were found in the Basic Secondary sample. In general, there was no clear evidence of cumulative ESAA program impact (i.e., increasing treatment-control differences in outcome) over the three years of the evaluation for any of the longitudinal samples. For most combinations of sample and achievement outcome measures, the control groups started slightly higher (though in general, not significantly so), and stayed slightly higher over successive test administrations, with little sign of any "catch-up" by the treatment group. One encouraging exception appeared in the Basic Elementary sample's reading achievement, where the gap between treatment and control groups was reduced between pretesting and posttesting in Year Three. Although this convergence trend was not statistically significant, it seems entirely consistent with the finding of ESAA program impact for the Year Three Basic Elementary sample.

F. RELATIONSHIPS AMONG ACHIEVEMENT SCORES, STUDENT VARIABLES, AND PROGRAM CHARACTERISTICS

Multivariate analyses were conducted to identify combinations of school, staff, and program factors associated with student achievement outcomes. These analyses were exploratory (non-experimental) in nature, as neither schools nor students were randomly assigned to the different program treatments being compared; rather, the analyses depended upon naturally occurring variations in program approach among the sample districts. Furthermore, although results reported here reflect patterns of relationships rather than isolated findings, few relationships were found in all subsamples or all outcome measures. For these reasons, the results may lack generalizability, and should be interpreted with some caution.

As in Year Two, there was some indication of better achievement in schools with higher expenditure levels, although there was no evidence of any specific funding level at which programs improved dramatically; i.e., no "critical mass" was identified. In general, Basic and Pilot elementary schools with higher per-pupil total expenditures and those with higher supplemental expenditures tended to have students with higher reading achievement. Furthermore, higher mathematics achievement was found in schools with larger per-pupil total expenditure levels.

Also corroborating Year Two findings was a positive relationship in the Year Three Basic Secondary sample between students' reading achievement and the extent of school activities designed to promote a favorable interracial climate (e.g., parent-teacher discussions, use of media to disseminate information about interracial plans and activities). Surprisingly, however, a negative relationship was found in the Basic Elementary sample between such activities and student achievement. A possible explanation is that since most Basic Elementary sample schools were almost completely desegregated before ESAA was created, the only elementary schools still finding it necessary in Year Three to devote much effort to the active promotion of interracial harmony were schools with substantial and disruptive racial strife. Secondary schools, by contrast, may have been desegregated somewhat more slowly; in such a case, desegregation-supporting school activities in Year Three may still have represented a positive and affirmative action rather than simply a reaction to obvious disharmony.

Both the Basic and Pilot Elementary samples showed a clear positive association between the number of hours the students spent in mathematics instruction and the students' residualized mathematics posttest scores.

In the Basic Elementary sample, students who perceived themselves as having a greater degree of control over their own environment and destiny tended to have higher achievement in reading and mathematics. Although the direction of causality (if any) between these perceptions and achievement could not be determined in the present study, it seems possible that procedures to enhance student feelings of control might be built into future programs (e.g., by giving students some voice in selection of materials) and that those feelings might have beneficial effects on achievement.

APPENDIX III-A

STATES IN EACH HEW REGION

HEW Region	States
I	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
II	New Jersey, New York, Puerto Rico, Virgin Islands
III	Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia, Alabama, Florida, Georgia, Kentucky
IV	Mississippi, North Carolina, South Carolina, Tennessee
V	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin
VI	Arkansas, Louisiana, New Mexico, Oklahoma, Texas
VII	Iowa, Kansas, Missouri, Nebraska
VIII	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming
IX	Arizona, California, Guam, Hawaii, Nevada
X	Alaska, Idaho, Oregon, Washington

APPENDIX III-B

PEARSON CORRELATIONS BETWEEN STAFF AND STUDENT MINORITY PERCENTAGES WITHIN SAMPLE SCHOOLS

Sample			All Schools			Treatment			Control		
			Students	Teachers	Administrators	Students	Teachers	Administrators	Students	Teachers	Administrators
Pilot Elementary	Cross-Sectional			(N=25)			(N=12)			(N=12)	
		Students	1.00	0.36	0.18	1.00	0.27	0.15	1.00	0.45	0.01
		Teachers		1.00	0.40*		1.00	0.42		1.00	0.39
		Administrators			1.00			1.00			1.00
	Longitudinal			(N=16)			(N=9)			(N=9)	
		Students	1.00	0.46	0.26	1.00	0.36	0.25	1.00	0.50	0.17
		Teachers		1.00	0.50		1.00	0.46		1.00	0.49
		Administrators			1.00			1.00			1.00
Basic Elementary	Cross-Sectional and Longitudinal			(N=39)			(N=20)			(N=19)	
		Students	1.00	0.66**	0.62**	1.00	0.65**	0.65**	1.00	0.66**	0.62**
		Teachers		1.00	0.45**		1.00	0.54*		1.00	0.37
		Administrators			1.00			1.00			1.00
Basic Secondary	Cross-Sectional			(N=23)			(N=15)			(N=14)	
		Students	1.00	0.91**	0.89**	1.00	0.94**	0.85**	1.00	0.83**	0.92**
		Teachers		1.00	0.76**		1.00	0.77**		1.00	0.78**
		Administrators			1.00			1.00			1.00
	Longitudinal			(N=11)			(N=7)			(N=6)	
		Students	1.00	0.94**	0.96**	1.00	0.94**	0.95**	1.00	0.89*	0.94**
		Teachers		1.00	0.91**		1.00	0.92**		1.00	0.91*
		Administrators			1.00			1.00			1.00

NOTE: Cell entries are the correlations of the minority percentages of the intersecting rows and columns. The number of schools is centered above each correlation matrix.

*Significant at the 0.05 level, two-tailed test.
**Significant at the 0.01 level, two-tailed test.

APPENDIX IV-A

BASIC ELEMENTARY SAMPLE: PRETEST ACHIEVEMENT (STANDARD SCORES) BY RACIAL/ETHNIC GROUP AND SEX

Racial/Ethnic Group	Reading Total						Math Total					
	Grade 3		Grade 4		Grade 5		Grade 3		Grade 4		Grade 5	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Black	311.40	317.42	329.93	342.33	362.35	364.93	286.28	288.25	321.08	327.89	350.70	358.70
(N)	(295)	(300)	(340)	(356)	(313)	(341)	(295)	(300)	(340)	(356)	(313)	(341)
Spanish	325.03	323.82	358.39	352.19	381.70	379.70	296.27	292.79	336.26	33.494	369.84	383.51
(N)	(34)	(38)	(39)	(47)	(57)	(43)	(34)	(38)	(39)	(47)	(57)	(43)
White	350.59	369.23	391.70	399.00	427.53	434.90	311.28	320.28	358.88	363.07	390.98	409.23
(N)	(457)	(394)	(405)	(363)	(372)	(364)	(457)	(394)	(405)	(363)	(372)	(364)
Other	370.00	372.21	I.N.	363.82	395.17	I.N.	344.40	342.14	I.N.	365.36	375.25	I.N.
(N)	(10)	(14)		(11)	(12)		(10)	(14)		(11)	(12)	

I.N. = Insufficient number to calculate reliable mean.

APPENDIX IV-B

BASIC ELEMENTARY SAMPLE: PRETEST ACHIEVEMENT (STANDARD SCORES) BY RACIAL/ETHNIC GROUP AND SOCIOECONOMIC STATUS

	Reading Total						Math Total					
	Grade 3		Grade 4		Grade 5		Grade 3		Grade 4		Grade 5	
Racial/Ethnic Group	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES
Black	311.99	315.54	325.24	343.70	355.78	368.85	283.49	289.74	317.59	329.58	349.22	358.72
(N)	(269)	(333)	(303)	(398)	(253)	(403)	(269)	(333)	(303)	(398)	(253)	(403)
Spanish	316.30	332.94	326.74	378.45	376.54	382.39	285.54	303.83	322.74	346.15	365.80	379.56
(N)	(37)	(35)	(39)	(47)	(35)	(66)	(37)	(35)	(39)	(47)	(35)	(66)
White	346.48	362.52	383.07	397.67	411.59	434.08	304.19	318.64	351.57	362.75	390.76	401.37
(N)	(197)	(657)	[illegible]41)	(629)	(102)	(635)	(197)	(657)	(141)	(629)	(102)	(635)
Other	356.67	380.07	I.N.	384.91	I.N.	390.07	I.N.	344.73	I.N.	388.18	I.N.	373.14
(N)	(9)	(15)		(11)		(14)		(15)		(11)		(14)

I.N. = Insufficient number to calculate reliable mean.

APPENDIX IV-C

BASIC SECONDARY SAMPLE: PRETEST ACHIEVEMENT (STANDARD SCORES) BY RACIAL/ETHNIC GROUP AND SEX

Racial/Ethnic Group	Reading Total						Math Total					
	Grade 10		Grade 11		Grade 12		Grade 10		Grade 11		Grade 12	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Black	113.26	117.36	122.43	122.95	128.40	129.37	448.39	450.62	450.54	451.71	465.75	481.65
(N)	(156)	(181)	(108)	(148)	(81)	(115)	(156)	(181)	(108)	(148)	(81)	(115)
Spanish	119.82	127.72	120.81	132.00	I.N.	I.N.	478.27	438.04	490.25	503.20	I.N.	I.N.
(N)	(34)	(25)	(16)	(15)			(34)	(25)	(16)	(15)		
White	137.51	139.93	146.36	152.57	157.60	156.19	536.08	537.67	552.30	571.40	589.73	571.04
(N)	(266)	(251)	(198)	(191)	(128)	(150)	(266)	(251)	(198)	(191)	(128)	(150)
Other (N)	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.

I.N. = Insufficient number to calculate reliable mean.

APPENDIX IV-D

BASIC SECONDARY SAMPLE: PRETEST ACHIEVEMENT (STANDARD SCORES) BY RACIAL/ETHNIC GROUP AND SOCIOECONOMIC STATUS

	Reading Total						Math Total					
	Grade 10		Grade 11		Grade 12		Grade 10		Grade 11		Grade 12	
Racial/Ethnic Group	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES
Black (N)	113.63 (216)	117.70 (128)	121.21 (159)	124.80 (99)	125.30 (132)	133.81 (68)	442.12 (216)	458.31 (128)	450.84 (159)	459.27 (99)	456.43 (132)	505.38 (68)
Spanish (N)	123.67 (39)	125.24 (21)	124.14 (14)	127.94 (17)	I.N.	I.N.	456.33 (39)	470.05 (21)	480.14 (14)	510.00 (17)	I.N.	I.N.
White (N)	137.20 (130)	139.32 (390)	150.64 (92)	149.41 (303)	151.17 (81)	159.24 (201)	512.91 (130)	545.18 (390)	550.52 (92)	564.69 (303)	542.25 (81)	595.43 (201)
Other (N)	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.	I.N.

I.N. = Insufficient number to calculate reliable mean.

APPENDIX IV-E

PILOT ELEMENTARY SAMPLE: PRETEST ACHIEVEMENT (STANDARD SCORES) BY RACIAL/ETHNIC GROUP AND SEX

Racial/Ethnic Group	Reading Total						Math Total					
	Grade 3		Grade 4		Grade 5		Grade 3		Grade 4		Grade 5	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Black	309.45	327.09	332.29	342.63	366.38	365.03	293.07	297.88	325.98	333.67	350.43	361.70
(N)	(234)	(233)	(258)	(254)	(330)	(300)	(234)	(233)	(258)	(254)	(330)	(300)
Spanish	301.92	314.79	328.19	330.65	356.92	363.13	290.09	289.58	322.02	323.97	352.03	365.71
(N)	(138)	(128)	(126)	(112)	(154)	(119)	(138)	(128)	(126)	(112)	(154)	(119)
White	326.77	346.62	343.10	372.35	396.17	411.74	298.93	308.21	328.30	344.00	378.18	389.54
(N)	(56)	(71)	(86)	(86)	(60)	(57)	(56)	(71)	(86)	(86)	(60)	(57)
Other	308.68	308.90	347.53	388.73	357.53	385.00	282.40	274.84	332.77	347.00	361.60	389.93
(N)	(25)	(19)	(17)	(11)	(15)	(15)	(25)	(19)	(17)	(11)	(15)	(15)

APPENDIX IV-F

PILOT ELEMENTARY SAMPLE: PRETEST ACHIEVEMENT (STANDARD SCORES) BY RACIAL/ETHNIC GROUP AND SOCIOECONOMIC STATUS

	Reading Total						**Math Total**					
	Grade 3		**Grade 4**		**Grade 5**		**Grade 3**		**Grade 4**		**Grade 5**	
Racial/Ethnic Group	**Low SES**	**High SES**	**Low SES**	**High SES**	**Low SES**	**High SES**	**Low SES**	**High SES**	**Low SES**	**High SES**	**Low SES**	**High SES**
Black	317.36	318.74	335.07	340.27	356.15	374.03	296.86	292.96	328.65	331.41	350.12	360.13
(N)	(272)	(199)	(283)	(231)	(302)	(329)	(272)	(199)	(283)	(231)	(302)	(329)
Spanish	305.80	310.45	325.65	334.76	359.91	359.32	290.18	289.68	321.86	324.76	358.44	357.50
(N)	(147)	(121)	(136)	(102)	(142)	(131)	(147)	(121)	(136)	(102)	(142)	(131)
White	338.10	337.60	356.06	359.44	398.83	406.58	301.52	307.02	335.74	336.58	372.37	389.69
(N)	(67)	(60)	(87)	(85)	(46)	(73)	(67)	(60)	(87)	(85)	(46)	(73)
Other	304.47	320.25	368.22	355.60	368.13	374.40	274.84	290.58	347.78	321.40	374.27	377.27
(N)	(32)	(12)	(18)	(10)	(15)	(15)	(32)	(12)	(18)	(10)	(15)	(15)

APPENDIX IV-G

BASIC ELEMENTARY SAMPLE: TREATMENT-CONTROL COMPARISONS OF STUDENT/FAMILY CHARACTERISTICS OTHER THAN ACHIEVEMENT PRETEST SCORES

Variable		Year Three Cross-Sectional						Longitudinal	
		Grade 3 (N = 20)		Grade 4 (N = 20)		Grade 5 (N = 19)		Grade 5 (N = 17)	
		Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Teacher-Student Interaction	Mean	70.65	72.27	70.99	69.57	68.25	68.32	68.53	68.74
	S.D.	4.51	3.63	3.84	2.96	2.03	2.58	2.28	3.53
Treatment by Principal	Mean	87.72	89.11	85.74	83.76	82.42	82.37	82.25	82.88
	S.D.	5.29	4.88	8.04	8.11	10.26	7.80	9.88	9.16
Mother's Education	Mean	2.09	2.12	2.03	2.06	1.95	1.99	1.91	2.05
	S.D.	0.53	0.41	0.39	0.50	0.38	0.47	0.40	0.52
Father's Education	Mean	2.15	2.28	2.06	2.21	2.03	2.08	2.09	2.16
	S.D.	0.52	0.58	0.49	0.65	0.58	0.63	0.62	0.66
Mother's Occupation	Mean	1.81	1.94	1.84	1.81	1.86	1.89	1.77	1.89
	S.D.	0.29	0.30	0.29	0.25	0.33	0.34	0.34	0.37
Father's Occupation	Mean	1.68	1.79	1.62	1.73	1.67	1.67	1.56	1.65
	S.D.	0.33	0.43	0.30	0.54	0.48	0.40	0.39	0.44
SES - Reading	Mean	4.30	4.29	4.46	4.64	4.76	4.74	4.82	4.84
	S.D.	0.66	0.66	0.70	0.64	0.53	0.54	0.62	0.61
SES - Luxury	Mean	6.95	7.10	7.09	7.40	7.38	7.58	7.41	7.75
	S.D.	1.09	0.87	0.97	0.85	0.90	0.87	1.05	0.94
Percentage Black	Mean	46.14	36.49	49.41	41.22	49.66*	41.52	49.65	42.34
	S.D.	29.52	33.34	32.63	32.99	34.44	32.61	37.53	34.90
Percentage White	Mean	44.52*	54.98	43.70	49.48	40.86	47.46	42.13	46.47
	S.D.	28.57	32.40	28.33	31.76	29.78	30.83	32.96	33.26
Percentage Female	Mean	45.58	50.39	50.56	49.34	50.23	50.09	49.91	49.42
	S.D.	10.79	9.74	8.06	8.60	7.97	7.07	9.75	11.92

*Treatment-control difference significant at .05 level.

APPENDIX IV-H

BASIC SECONDARY SAMPLE: TREATMENT-CONTROL COMPARISONS OF STUDENT/FAMILY CHARACTERISTICS OTHER THAN ACHIEVEMENT PRETEST SCORES

Variable		Year Three Cross-Sectional Sample						Longitudinal Sample	
		Grade 10		Grade 11		Grade 12		Grade 12	
		Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Teacher-Student Interaction	Mean	74.49	74.35	75.85	76.60	75.54	76.86	77.18	76.94
	S.D.	2.70	1.86	4.39	3.68	3.76	3.30	4.69	6.00
	N	12	12	12	12	11	11	6	6
Treatment by Administrators I	Mean	78.30	76.30	81.18	79.77	80.15	80.36	82.44	78.83
	S.D.	7.15	4.65	5.58	5.58	4.92	5.75	8.06	6.04
	N	12	12	12	12	11	11	6	6
Treatment by Administrators II	Mean	80.92	80.64	84.59	84.04	87.32	86.92	85.33	85.30
	S.D.	5.22	4.97	4.65	6.13	7.74	7.43	6.52	8.29
	N	12	12	12	12	11	11	6	6
Perceived School Discrimination	Mean	82.04	84.97	84.01	85.34	82.34	86.27	88.75	88.91
	S.D.	6.68	9.03	5.73	2.98	6.70	3.22	5.45	5.60
	N	6	6	6	6	6	6	3	3
Student Intergroup Relations	Mean	75.09	75.50	69.85	71.93	67.60	71.23	68.87	68.39
	S.D.	3.81	4.32	2.69	4.06	3.99	5.88	4.62	6.50
	N	6	6	6	6	6	6	3	3
Index of Alienation	Mean	83.59	82.74	84.71	85.31	85.22	85.66	85.48	84.57
	S.D.	3.19	3.80	2.75	2.15	4.06	3.53	4.16	4.60
	N	12	12	12	12	11	11	6	6
Mother's Education	Mean	2.12	2.13	2.14	2.09	1.92	2.09	1.75	2.25
	S.D.	0.30	0.33	0.31	0.33	0.32	0.36	0.36	0.69
	N	12	12	12	12	11	11	6	6
Father's Education	Mean	2.20	2.29	2.30	2.27	2.13	2.20	1.90*	2.26
	S.D.	0.26	0.30	0.36	0.39	0.40	0.47	0.41	0.60
	N	12	12	12	12	11	11	6	6

*Treatment-control difference significant at .05 level.

APPENDIX IV-H (CONT.)

BASIC SECONDARY SAMPLE: TREATMENT-CONTROL COMPARISONS OF STUDENT/FAMILY CHARACTERISTICS OTHER THAN ACHIEVEMENT PRETEST SCORES

Variable		Year Three Cross-Sectional Sample						Lontitudinal Sample	
		Grade 10		Grade 11		Grade 12		Grade 12	
		Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Mother's Occupation	Mean	1.95	2.01	2.00	2.11	1.94	1.89	1.68	2.06
	S.D.	0.22	0.25	0.42	0.19	0.38	0.39	0.20	0.54
	N	12	12	12	12	11	11	6	6
Father's Occupation	Mean	1.85	1.77	1.89	1.99	1.84	1.80	1.72	2.02
	S.D.	0.32	0.28	0.38	0.30	0.42	0.42	0.47	0.43
	N	12	12	12	12	11	11	5	5
SES, Reading	Mean	4.91	4.96	5.04	5.01	4.87*	5.19	4.82	5.35
	S.D.	0.48	0.45	0.57	0.54	0.46	0.57	0.69	0.39
	N	12	12	12	12	11	11	6	6
SES, Luxury	Mean	7.55	7.48	7.67	7.63	7.23	7.52	7.26	7.68
	S.D.	0.90	0.60	0.81	0.77	0.92	0.64	1.15	0.60
	N	12	12	12	12	11	11	6	6
Percentage Black	Mean	41.93	35.02	39.95	41.24	46.49	40.65	55.09	57.80
	S.D.	33.88	33.98	37.72	36.70	34.76	37.54	43.75	44.55
	N	12	12	12	12	11	11	6	6
Percentage White	Mean	50.33	58.98	55.28	52.70	50.58	56.99	43.40	41.27
	S.D.	31.26	31.17	36.26	35.08	33.56	35.84	41.96	43.42
	N	12	12	12	12	11	11	6	6
Percentage Female	Mean	48.33	51.73	49.33	56.08	50.62	60.37	62.85	55.64
	S.D.	8.36	11.14	9.54	10.59	11.79	15.78	19.97	19.47
	N	12	12	12	12	11	11	6	6

*Treatment-control difference significant at .05 level.

APPENDIX IV-J

PILOT ELEMENTARY SAMPLE: TREATMENT-CONTROL COMPARISONS OF STUDENT/FAMILY CHARACTERISTICS OTHER THAN ACHIEVEMENT PRETEST SCORES

Variable		Year Three Cross-Sectional						Longitudinal	
		Grade 3 (N = 10)		Grade 4 (N = 11)		Grade 5 (N = 13)		Grade 5 (N = 8)	
		Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Teacher-Student Interaction	Mean	69.04	70.33	69.40	70.65	68.65	67.46	68.65	68.18
	S.D.	3.36	3.93	4.42	2.36	5.00	4.31	4.85	2.88
Treatment by Principal	Mean	80.75	85.44	80.04	84.00	79.50	79.14	78.93	76.77
	S.D.	6.50	6.34	6.80	3.83	9.92	6.79	10.02	6.97
Mother's Education	Mean	1.74	1.66	1.60	1.76	1.76	1.55	1.85	1.65
	S.D.	0.23	0.27	2.34	0.35	0.40	0.37	0.23	0.41
Father's Education	Mean	1.71	1.63	1.69	1.75	1.63	1.60	1.66	1.68
	S.D.	0.27	0.42	0.45	0.43	0.35	0.43	0.27	0.52
Mother's Occupation	Mean	1.77	1.52	1.75	1.69	1.93	1.68	1.80	1.86
	S.D.	0.33	0.32	0.34	0.41	0.57	0.41	0.33	0.46
Father's Occupation	Mean	1.39	1.35	1.32	1.42	1.45	1.49	1.43	1.41
	S.D.	0.19	0.40	0.17	0.31	0.24	0.54	0.14	0.26
SES, Reading	Mean	3.67	3.69	4.00	3.94	4.42	4.37	4.70	4.66
	S.D.	0.61	0.74	0.54	0.57	0.46	0.65	0.39	0.44
SES, Luxury	Mean	5.90	6.14	6.01	6.13	6.33	6.62	6.77	6.98
	S.D.	0.49	0.76	0.75	0.51	0.70	0.62	0.62	0.59
Percentage Black	Mean	53.05	48.38	56.51	57.35	64.65	63.38	69.12	69.91
	S.D.	41.44	42.67	43.51	43.36	42.02	44.95	39.74	44.13
Percentage White	Mean	12.58	14.27	15.79	16.63	8.85	10.05	13.42	13.07
	S.D.	12.31	15.08	14.92	14.29	9.07	12.35	15.52	15.75
Percentage Female	Mean	48.84	54.81	49.28	48.16	46.82	46.71	43.13	48.35
	S.D.	9.81	7.27	9.11	6.70	7.87	8.77	13.99	5.97

APPENDIX V-A

BASIC ELEMENTARY SAMPLE: DOLLAR ALLOCATIONS OF SUPPLEMENTAL FUNDS IN PAIRED TREATMENT AND CONTROL SCHOOLS*

Group		Type of Funding	Reading	Math	Guidance and Counseling	Health Services	New Curricula	Intergroup and Cultural Enrichment	Career Education	Community Activities	Administrative and Auxiliary Services	Other Costs
Year Three Cross-Sectional and Longitudinal**	Treatment	Total (N=20)	338.36 592.02	59.99 54.88	18.44 42.14	1.07 2.70	37.88 151.35	1.97 6.27	2.38 6.39	4.07 12.13	29.66 55.85	31.30 88.73
		Non-ESAA (N=12)	209.37 334.70	53.15 54.78	1.79 3.34	9.02 18.74	52.46 180.05	0.63 2.19	3.43 8.01	0.39 0.83	16.16 22.07	35.71 114.42
		ESAA (N=20)	212.79 363.49	28.10 41.62	13.03 33.62	0.0 0.0	6.40 15.76	1.59 4.75	0.33 1.46	3.84 12.19	20.06 44.92	9.87 16.90
	Control	Total (N=7)	212.69 247.43	28.12 52.25	10.85 16.17	2.70 4.15	112.00 293.99	0.0 0.0	2.39 6.33	1.15 1.92	19.06 20.82	19.08 36.82
		Non-ESAA (N=6)	121.03 148.50	23.20 54.35	3.15 4.36	12.66 16.92	121.41 294.80	0.0 0.0	2.79 6.84	0.65 0.81	8.27 10.47	4.62 8.19

*The upper figure in each cell is the mean dollar allocation across sample schools, and the lower figure is the standard deviation.

**Basic Elementary cross-sectional and longitudinal samples were identical.

APPENDIX V-B

BASIC SECONDARY SAMPLE: DOLLAR ALLOCATIONS OF SUPPLEMENTAL FUNDS IN PAIRED TREATMENT AND CONTROL SCHOOLS*

Group		Type of Funding	Reading	Math	Guidance and Counseling	Health Services	New Curricula	Intergroup and Cultural Enrichment	Career Education	Community Activities	Administrative and Auxiliary Services	Other Costs
Cross-Sectional	Treatment	Total (N=13)	56.31 60.09	23.96 51.58	1.64 5.92	0.0 0.0	0.47 1.69	4.39 7.40	1.76 5.12	6.78 20.78	8.07 14.09	6.72 6.89
		Non-ESAA (N=4)	9.15 5.97	1.65 2.67	0.0 0.0	0.0 0.0	1.52 3.05	0.0 0.0	0.0 0.0	0.0 0.0	0.51 1.02	0.25 0.51
		ESAA (N=13)	53.50 62.31	23.45 51.81	1.56 5.64	0.0 0.0	0.0 0.0	4.39 7.40	1.76 5.12	6.78 20.78	7.99 14.11	6.72 6.89
	Control	Total (N=4)	67.52 21.05	13.30 25.92	5.33 10.67	0.0 0.0	1.52 3.05	0.0 0.0	4.57 9.13	0.0 0.0	7.03 5.92	13.30 4.37
		Non-ESAA (N=1)	1.02 0.0	1.02 0.0	0.0 0.0	0.0 0.0	6.10 0.0	0.0 0.0	0.0 0.0	0.0 0.0	2.03 0.0	1.02 0.0
Longitudinal	Treatment	Total (N=6)	32.65 31.17	11.17 14.44	3.56 8.71	0.0 0.0	1.02 2.49	6.31 9.80	0.0 0.0	2.22 5.43	2.71 3.67	5.67 3.87
		Non-ESAA (N=1)	1.02 0.0	1.02 0.0	0.0 0.0	0.0 0.0	6.10 0.0	0.0 0.0	0.0 0.0	0.0 0.0	2.03 0.0	1.02 0.0
		ESAA (N=6)	32.48 31.04	11.00 14.59	3.39 8.30	0.0 0.0	0.0 0.0	6.31 9.80	0.0 0.0	2.22 5.43	2.55 3.56	5.67 3.87
	Control	Total (N=2)	68.08 22.99	0.51 0.72	10.67 15.09	0.0 0.0	3.05 4.31	0.0 0.0	0.0 0.0	0.0 0.0	7.11 2.87	9.65 0.72
		Non-ESAA (N=1)	1.02 0.0	1.02 0.0	0.0 0.0	0.0 0.0	6.10 0.0	0.0 0.0	0.0 0.0	0.0 0.0	2.03 0.0	1.02 0.0

*The upper figure in each cell is the mean dollar allocation across sample schools, and the lower figure is the standard deviation.

APPENDIX V-C

PILOT ELEMENTARY SAMPLE: DOLLAR ALLOCATIONS OF SUPPLEMENTAL FUNDS IN PAIRED TREATMENT AND CONTROL SCHOOLS*

Group		Type of Funding	Reading	Math	Guidance and Counseling	Health Services	New Curricula	Intergroup and Cultural Enrichment	Career Education	Community Activities	Administrative and Auxiliary Services	Other Costs
Year Three Cross-Sectional	Treatment	**Total** (N=12)	209.93 196.50	42.97 49.21	3.48 10.24	1.05 2.63	55.65 102.88	0.36 1.26	1.08 2.89	8.32 14.94	25.30 28.65	28.62 35.38
		Non-ESAA (N=7)	84.85 89.39	21.57 26.97	5.55 13.39	1.64 2.98	19.76 51.35	0.62 1.65	1.40 3.71	3.01 3.67	8.38 7.33	18.16 16.25
		ESAA (N=12)	160.43 180.32	30.39 51.33	0.25 0.87	0.09 0.31	44.12 100.76	0.0 0.0	0.26 0.91	6.57 15.32	20.33 26.39	18.19 25.22
	Control	Total (N=8)	280.30 194.65	40.15 69.30	23.80 42.93	2.33 4.32	51.21 103.59	0.0 0.0	1.62 3.49	8.22 14.13	33.39 32.04	41.49 35.12
		Non-ESAA (N=6)	128.90 115.49	40.26 67.52	18.73 42.99	2.75 4.29	66.55 117.82	0.0 0.0	2.16 3.95	2.13 2.34	13.67 16.45	26.19 31.00
Longitudinal	Treatment	Total (N=9)	143.91 143.46	40.64 53.27	4.65 11.75	1.40 2.99	74.20 114.04	0.48 1.45	1.44 3.31	5.14 4.63	30.63 30.59	27.45 32.61
		Non-ESAA (N=6)	89.66 96.92	12.72 14.70	6.47 14.42	1.92 3.16	23.05 55.44	0.73 1.78	1.63 4.00	3.51 3.75	7.64 7.73	18.27 17.80
		ESAA (N=9)	84.13 92.85	32.16 56.01	0.33 1.00	0.12 0.36	58.83 113.95	0.0 0.0	0.35 1.05	2.80 4.34	25.43 28.66	15.49 20.57
	Control	Total (N=6)	206.61 137.89	52.57 77.33	31.73 47.72	3.11 4.82	68.29 116.72	0.0 0.0	2.16 3.95	3.96 4.03	41.41 33.07	41.01 34.10
		Non-ESAA (N=5)	153.28 110.51	47.14 73.09	22.47 46.95	3.30 4.56	79.86 129.59	0.0 0.0	2.59 4.26	2.56 2.34	16.17 17.07	31.19 31.83

*The upper figure in each cell is the mean dollar allocation across sample schools, and the lower figure is the standard deviation.

APPENDIX V-D

CORRELATIONS OF EXPENDITURES AND PRETEST SCORES

Sample	Funding	Treatment		Control	
		Reading	Math	Reading	Math
Basic Elementary	Regular	.47**	.39*	.44*	.47*
	ESAA	.13	.10	n.a.	n.a.
	Total Supplemental	.36*	.32	.29	.46*
	Total	.51*	.44*	.40*	.51**
Basic Secondary	Regular	.68**	.54**	.58*	.61**
	ESAA	-.06	-.01	n.a.	n.a.
	Total Supplemental	-.04	.01	-.26	-.11
	Total	.66**	.53*	.57*	.61**
Pilot Elementary	Regular	.38	.03	.21	.07
	ESAA	-.24	.06	n.a.	n.a.
	Total Supplemental	-.26	-.06	-.06	.04
	Total	.17	-.01	.13	.07

*Correlation significant at .05 level.

**Correlation significant at .01 level.

APPENDIX V-E

SAMPLE SCHOOL CHARACTERISTICS

1. Staff Characteristics: Teacher Experience and Undergraduate Major Field*

Characteristics	Basic Elementary Sample				Basic Secondary Sample				Pilot Elementary Sample			
	Reading		Mathematics		Reading		Mathematics		Reading		Mathematics	
	Regular	Remedial	Regular	Remedial	Regular	Remedial	Regular	Remedial	Regular	Remedial	Regular	Remedial
Teaching Experience:	(N=366)	(N=48)	(N=360)	(N=32)	(N=221)	(N=38)	(N=129)	(N=33)	(N=198)	(N=36)	(N=208)	(N=14)
5 years or less	34.1	35.4	33.8	56.2	24.9	34.2	25.6	42.4	36.4	33.3	38.5	42.9
6-10 years	26.0	22.9	24.7	18.8	27.6	18.4	33.3	30.3	24.7	25.0	23.1	7.1
Over 10 years	39.9	41.7	41.4	25.0	47.5	47.4	41.1	27.3	38.9	41.7	38.4	50.0
Average number of years	10.3	10.6	10.6	8.0	11.2	10.7	10.4	9.1	10.3	10.9	10.9	10.5
Major Field:	(N=312)	(N=39)	(N=307)	(N=28)	(N=187)	(N=31)	(N=118)	(N=26)	(N=173)	(N=31)	(N=186)	(N=12)
Elementary or Secondary Education	82.7	64.1	83.1	67.9	1.5	6.5	3.4	3.8	75.7	74.2	77.4	75.0
Remedial or Special Education	0.3	5.1	0.7	3.6	0.0	9.7	0.0	0.0	0.0	0.0	0.0	0.0
English	1.9	2.6	1.9	3.6	82 3	54.8	0.8	0.0	2.9	12.9	2.2	0.0
Mathematics	0.6	0.0	0.6	0.0	0.5	0.0	82.2	61.5	0.0	0.0	0.0	16.7
Other	14.5	28.2	13.7	25.0	16.6	29.0	13.6	34.6	21.3	12.9	20.4	8.3

*Cell entries represent percentages of responding teachers in each category.

APPENDIX V-E (CONT.)

SAMPLE SCHOOL CHARACTERISTICS

2. Physical Characteristics: Reading and Mathematics Areas*

Characteristic	Basic Elementary Sample		Basic Secondary Sample		Pilot Elementary Sample	
	Regular	Remedial	Regular	Remedial	Regular	Remedial
Reading Area:	(N=373)	(N=48)	(N=223)	(N=38)	(N=202)	(N=34)
Movable chairs and desks	90.6	97.9	93.7	97.4	90.6	100.0
Movable walls or casual furniture	19.0	31.2	18.4	26.3	15.8	32.4
Special arrangements for activities	30.0	41.7	11.7	36.8	24.8	41.2
Display materials	80.9	87.5	57.8	63.2	75.7	82.4
Class library	54.4	56.3	23.8	63.2	55.0	55.9
Mathematics Area:	(N=366)	(N=32)	(N=133)	(N=34)	(N=210)	(N=14)
Movable chairs and desks	88.0	93.8	91.0	88.2	92.4	100.0
Study carrels	15.0	43.7	0.8	11.8	21.0	50.0
Enrichment or resource center	30.4	71.9	12.0	5.9	30.5	42.9
Display materials	96.2	90.6	69.2	82.4	98.6	92.9

*Cell entries represent the percentage of responding teachers selecting each category.

APPENDIX V-E (CONT.)

SAMPLE SCHOOL CHARACTERISTICS

3. Frequency of Material Use: Reading and Mathematics*

Frequency	Basic Elementary Sample		Basic Secondary Sample		Pilto Elementary Sample	
	Regular	**Remedial**	**Regular**	**Remedial**	**Regular**	**Remedial**
Used at Least Once a Week:	(N=350)	(N=46)	(N=196)	(N=360	(N=174)	(N=31)
Student-selected[(1)]	91.7	95.6	55.2	91.6	95.4	96.8
Supplementary[(2)]	99.7	97.5	84.2	100.0	98.8	100.9
Audio-visual[(3)]	51.9	81.8	57.8	79.4	68.5	70.9
Narrative[(4)]	73.0	56.9	59.8	94.6	74.6	63.4
Teacher-created[(5)]	95.6	100.0	90.6	97.2	94.7	93.7
Used Over 40 Percent of Time:	(N=363)	(N=32)	(N=131)	(N=33)	(N=207)	(N=14)
Textbook	57.0	13.3	79.4	15.1	45.4	0.0
Workbook	9.3	13.0	0.0	15.6	11.7	231.
Commercial ditto sheets	14.6	31.3	2.4	22.0	19.6	21.4
Teacher-made ditto sheets	23.4	29.0	14.7	42.0	24.6	14.2
Manipulative devices and aids	9.0	37.5	1.6	9.4	10.6	38.5
Electronic calculators	0.6	0.0	2.4	0.0	0.5	8.3
Special equipment used at least once a week[(6)]	12.7	25.0	0.0	0.0	16.9	0.0

*Cell entries represent the percentage of responding teachers selecting each category.

NOTES:

(1) Student-selected: free-reading books, word games and puzzles, educational kits.

(2) Supplementary: supplementary readers, programmed reading texts, workbooks, reference material.

(3) Audio-visual: tapes or records, films or filmstrips, reading machines.

(4) Narrative: teacher-read stories, student-performed or -read plays, newspapers and magazines.

(5) Teacher-created: duplicating masters, instructional exercises.

(6) Special equipment: controlled reader, Hoffman reader headsets, System 80.

APPENDIX V-E (CONT.)

SAMPLE SCHOOL CHARACTERISTICS

4. Basis of Student Class Assignment*

Basis	Basic Elementary Sample				Basic Secondary Sample				Pilot Elementary Sample			
	Reading		Mathematics		Reading		Mathematics		Reading		Mathematics	
	Regular (N=330)	Remedial (N=82)	Regular (N=315)	Remedial (N=25)	Regular (N=211)	Remedial (N=32)	Regular (N=131)	Remedial (N=32)	Regular (N=183)	Remedial (N=31)	Regular (N=172)	Remedial (N=11)
Regular class members	82.7	0.0	84.1	4.0	83.5	43.8	92.4	40.6	73.2	12.9	82.6	18.2
Teacher referral	3.6	21.9	1.9	24.0	4.7	3.1	2.3	6.3	4.4	19.4	7.0	18.2
Achievement test	6.1	62.5	5.1	48.0	10.0	34.4	1.5	37.5	7.1	54.8	4.1	54.5
Diagnostic test	7.6	15.6	8.9	24.0	1.9	18.8	3.8	15.6	15.3	12.9	6.4	9.1

5. Approaches to Teaching Reading*

Approach	Basic Elementary Sample				Basic Secondary Sample				Pilot Elementary Sample			
	Regular (N=362)		Remedial (N=43)		Regular (N=207)		Remedial (N=36)		Regular (N=188)		Remedial (N=33)	
	Major Approach	No Use	Major Approach	No Use	Major Approach	No Use	Major Approach	No Use	Major Approach	No Use	Major Approach	No Use
Letter-sound	87.7	3.6	50.0	23.8	17.0	64.1	35.3	35.3	86.3	2.7	78.8	9.1
Content-comprehension	64.4	4.4	38.1	9.5	72.2	4.9	66.7	2.8	55.1	6.4	42.8	15.2
Student-selected and created	21.6	28.0	37.2	14.0	34.2	15.3	28.6	17.1	20.7	23.4	39.4	6.1

*Cell entries represent the percentage of responding teachers selecting each category.

APPENDIX V-E (CONT.)

SAMPLE SCHOOL CHARACTERISTICS

6. Reading Activities: Elementary Schools*

Activity	Basic Elementary Sample		Pilot Elementary Sample	
	Regular (N=366)	Remedial (N=47)	Regular (N=197)	Remedial (N=33)
Letter-sound	88.5	91.7	90.1	91.2
Language skills	97.1	97.9	95.0	94.1
Timed readings	20.6	20.8	21.3	2.9
Student material	49.3	16.7	51.0	32.4

*Cell entries represent the percentage of responding teachers reporting frequent student participation in each activity.

7. Mathematics Activities*

Activity	Basic Elementary Sample		Basic Secondary Sample		Pilot Elementary Sample	
	Regular (N=364)	Remedial (N=32)	Regular (N=132)	Remedial (N=33)	Regular (N=209)	Remedial (N=14)
Math vocabulary	9.7	15.7	11.5	3.0	16.8	28.6
Word problems	28.0	28.1	19.3	9.4	38.1	14.3
Symbols	17.9	19.4	13.3	10.3	24.3	35.7
Properties and axioms	17.6	10.8	21.2	14.3	23.1	10.0
Number sentences	32.1	40.6	27.8	20.7	41.0	28.6
Number sentences	32.1	40.6	27.8	20.7	41.0	28.6
Sets	24.9	31.2	12.0	7.4	33.4	35.8
Sets	24.9	31.2	12.0	7.4	33.4	35.8
Geometric concepts	27.8	16.1	30.9	7.2	28.6	21.4
Measurement	21.8	26.7	19.4	23.4	38.7	21.4
Number theory	26.6	24.1	21.1	13.4	37.7	25.0
Fundamental operations	82.1	87.0	44.2	90.9	80.6	57.2
Number system structure	34.2	43.3	23.2	20.0	44.4	21.4
Mathematics history	5.9	3.6	1.6	3.3	9.6	0.0
Computation drilling	85.3	83.9	55.7	84.8	82.3	57.2
Drilling (alternate question)	90.7	96.9	77.5	93.9	86.6	64.2
Review	56.6	50.0	33.3	54.5	53.1	46.2
Games or puzzles	71.5	90.6	20.3	51.5	68.6	64.3
Physical models	40.3	68.8	36.6	21.9	41.4	64.3

*Cell entries represent the percentage of responding teachers reporting weekly student participation in each activity.

APPENDIX V-E (CONT.)

SAMPLE SCHOOL CHARACTERISTICS

8. Instructional Individualization*

Extent of Individualization	Basic Elementary Sample				Basic Secondary Sample				Pilot Elementary Sample			
	Reading		Mathematics		Reading		Mathematics		Reading		Mathematics	
	Regular (N=370)	Remedial (N=47)	Regular (N=359)	Remedial (N=31)	Regular (N=218)	Remedial (N=37)	Regular (N=133)	Remedial (N=33)	Regular (N=202)	Remedial (N=34)	Regular (N=207)	Remedial (N=13)
Instruction varies among students curriculum	67.5	77.3	61.0	71.9	45.2	75.0	34.4	51.6	64.9	81.3	60.8	57.1
Content based on individual needs	33.2	86.0	43.6	86.6	36.2	88.2	12.8	69.7	36.9	74.2	43.8	75.0
No lesson plans	4.7	11.4	6.4	9.7	6.2	5.6	7.6	15.2	7.6	9.4	12.6	33.3
Frequent** tests or quizzes	39.8	31.1	41.2	50.0	33.5	45.9	28.6	40.7	40.6	48.5	43.4	42.8

*Cell entries represent the percentage of responding teachers selecting each category.

**More often than once per week.

9. Feedback to Students*

Type of Feedback	Basic Elementary Sample				Basic Secondary Sample				Pilot Elementary Sample			
	Reading		Mathematics		Reading		Mathematics		Reading		Mathematics	
	Regular (N=367)	Remedial (N=48)	Regular (N=359)	Remedial (N=32)	Regular (N=212)	Remedial (N=38)	Regular (N=129)	Remedial (N=33)	Regular (N=199)	Remedial (N=33)	Regular (N=205)	Remedial (N=14)
Grade	90.8	75.0	94.7	84.2	80.4	75.7	81.9	85.2	82.6	64.3	86.4	55.6
Information on strengths	83.9	89.5	83.0	93.8	63.7	83.7	68.8	84.8	79.6	97.0	79.0	71.4
Information on weaknesses	83.0	81.2	85.8	90.6	62.5	81.0	71.3	87.9	75.8	100.0	80.2	71.4

*Cell entries represent the percentage of responding teachers reporting at least weekly feedback in each area.

APPENDIX V-F

PERSONNEL ALLOCATION COST INDEX METHODOLOGY

The resource cost analysis is based in part on resource use information collected from the teachers who provided regular and remedial reading and math instruction to the sample students. These teachers were asked to complete a questionnaire that included items on the amount of time devoted to regular or remedial reading or math instruction, and on the amount of time special staff were used either to assist with regular or remedial reading or math instruction, or to counsel the students. The special staff about whom data were collected included remedial reading specialists, remedial math specialists, instructional aides, media specialists, speech therapists, and school counselors.

Salary information collected from school district business offices was used to calculate average hourly salary rates for each type of staff member. The average salary rates were used to control interdistrict cost-of-living variations, as reflected in actual staff salaries. The use of average salaries permitted the application of a standardized dollar metric to the resources allocated for reading and math instruction. While this procedure did not yield the precise reading and math costs incurred by a given school, it did provide a standardized basis for meaningful comarisons among schools.

Separate average hourly salary scales were calculated for elementary and secondary school staff (see Table V-F-1). Because school districts normally have separate salary schedules for elementary and secondary school staff, this distinction was maintained in computing average salary rates. In constructing these average hourly salary rates, no attempt was made to develop rates that differentiated staff on the basis of previous experience or level of formal training; it was considered desirable to ensure that any treatment-control differences in resource use reported here not be compounded by such differences in salary rates.

PERSONNEL ALLOCATION COST INDEX METHODOLOGY

TABLE V-F-1. AVERAGE HOURLY SALARY RATES FOR STAFF USED IN ELEMENTARY AND SECONDARY SCHOOLS (INCREASED BY 15% TO INCLUCE FRINGE BENEFITS)

Type of Saff	Elementary Schools	Secondary Schools
Classroom teacher	$ 9.41	$ 9.48
Remedial reading specialist	10.25	10.03
Remedial math specialist	9.79	9.74
Instructional aide	5.27	5.45
Speech therapist	10.12	10.32
Media specialist	12.12	12.03
School counselor	11.42	11.64

The goal of the resource cost calculation for regular reading and math instruction was to determine each school's dollar investment in this instruction, for each student in the pool from which sample students were drawn. Since resource allocation data were not available for individual students, one assumption had to be made: that within the sample classes, average per-pupil resource allocation figures for the total classes were applicable to the ESAA-participating (or ESAA-eligible) students. This assumption appears reasonable, on the basis of in-depth observations of a subsample of classes.

To calculate the per-pupil costs for a particular component of regular reading (or math) instruction, a weekly cost was first determined for an entire class. For example, a teacher might report that he or she spent four hours each week teaching reading to a class of 30 students. That teacher's salary (actually, a standardized source figure) for the four hours was then divided by 30 and summed across weeks to obtain a yearly cost allocation per student per year for regular reading instruction. Similar calculations were performed for the other teachers in that school, and the results were averaged to obtain representative costs for the school. The same general procedures were used to calculate per-year, per-pupil costs for other components of regular reading and math instruction, such as the use of remedial specialists or instructional aides in the classroom. (Note: Instruction by remedial specialists or other individuals outside the regular classroom, on a pullout basis, was not included in the figures for regular instruction, but was considered part of the remedial instruction allocations calculated separately.)

The goal of the cost calculation for reading and math instruction was to determine each school's dollar investment in remedial reading and math, for each student in the population from which sample students were drawn. Two assumptions were made in performing the calculations. First, it was assumed that essentially all of the remedial instruction in reading or math was, for the sample classes involved, in addition to, not instead of, their regular classroom instruction in those content areas. That is, when students were to receive remedial instruction in reading, they were not pulled out of regular reading classes, but out of classes in other subject areas, such as social studies. This assumption was confirmed by questionnaire data from the teachers, as well as by classroom observations in the in-depth sample schools.

Second, also on the basis of classroom observations in the in-depth sample schools, the services of specialists and other personnel involved in remedial instruction were assumed to be distributed fairly evenly during the year across all students in the sample classes; that is, students specifically designated by the schools as ESAA-participating or -eligible students constituted a large component of most of the sample classes; even where this was not the cases, other, non-ESAA students were observed to be quite similar to the ESAA students in performance level, socioeconomic status, and racial/ethnic mix.

The reading or math specialist was asked how many students he or she normally worked with at a given time, and how many hours each week he or she spent, on the average, teaching that group. Similar data were also obtained for other types of resource staff participating in reading instruciton. On the basis of

PERSONNEL ALLOCATION COST INDEX METHODOLOGY

the equal-distribution assumption, the allocation data for one group of students were then generalized to all students in the sample classes. Thus, yearly per-pupil staff resource costs were determined across the same total set of students used to calculate the regular instructional costs. This set consisted of all students in all sample classes from which the resource allocation data were drawn.

APPENDIX V-G

INTERCULTURAL PROGRAMS FACTOR STRUCTURE

Program	Basic Elementary Factor			Basic Secondary Factors			
	Participation	Student Activities	Continuing Education	Teacher Participation	Student Participation	Student Activities	Continuing Education
Cultural Enrichment/Intergroup Relations:							
Recency of non-inservice special training	.19	.03	.74	.18	.12	.01	.46
Number of hours of inservice training in current year	.10	.21	.43	.16	.07	.04	.78
Percentage of students participating	.67	.07	.06	.12	.79	.21	.06
Average number of hours per month of student particiaption	.75	.20	.18	.15	.64	.29	.09
Discussions (per year)	.44	.25	.18	.22	.42	.50	.07
Informational presentations (per year)	.24	.66	.10	.17	.26	.65	.02
Intercultural presentations (per year)	.29	.57	.13	.19	.24	.64	.04
Visits to places of special interest (per year)	.26	.56	.01	.11	.08	.71	.05
Interchanges with students (per year)	.27	.34	.16	.10	.11	.65	.07
Classroom time devoted to activities	.67	.29	.18	.50	.26	.28	.15
Hours in needs assessement, program planning and evaluation	.65	.27	.14	.84	.13	.18	.16
Hours in curriculum development	.58	.32	.25	.71	.08	.23	.28
Guidance and Counseling:							
Number of students in group counseling/guidance programs	.25	.04	.02	.03	.11	.10	.01
Number of students in individual counseling/guidance programs	.17	.09	.10	.00	.10	.01	.00

NOTE: Omitted from the table are the following items, which did not relate to any of the factors: years of full time teaching experience, perception of effects of desegregation upon school, amount of racial mixing among teachers, and minority status of teacher.

APPENDIX VI-A

PURPOSES AND DERIVATION OF ESAA SCALE SCORES

From the first two years' data analysis, three issues concerning the adequacy of existing achievement scale scores and norms emerged that would affect interpretation of students' performance levels, particularly in the longitudinal elementary cohorts. First, the student population served by ESAA programs has a large percentage of minority and disadvantaged students; such students tend to score at the low end of the score distributions, where the publisher's norms are considerably less precise than near the center of the distribution. Second, because of the longitudinal nature of the evaluation, some of the Basic and Pilot Elementary sample students progressed through grades spanning two levels of the test (Levels 2 and 3). While scores on a common metric were available from the publisher, there was reason to believe that those scale scores might be subject to level-articulation problems; this issue is discussed in Chapter IX of the Year Two Report.* Finally, alternate forms of the test were used for pretest and posttest administration, with students randomly assigned to a particular test form in a counterbalanced design. Both the publisher's technical reports and the ESAA test results showed that one of the forms was substantially more difficult than the other. Thus, it seemed that this disparity in difficulty might adversely affect the accuracy of pretest-posttest and treatment-control comparisons.

SDC's restandardization study, based on data from the 1975-76 school year, involved rescaling and renorming the achievement measures; products of these activities were:

- Construction of a common metric scale, so that a unique scale score would be derived for students of equal achievement, regardless of test level.

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*The Second Year of Emergency School Aid Act (ESAA) Implementation. System Development Corporation, TM-5236/009/00, July 1976.

- Equating of the two alternate test forms, so that the scale score estimates of student performance would not be affected by the test form used to measure the achievement.
- Provision of percentile rank norms for a population with the characteristics of the ESAA participants.

Analyses using the two sets of scores (i.e., scores based on the publisher's norms and on SDC's new norms) revealed virtually no difference in patterns of achievement results, or in the significance level of differences between treatment and control groups. Because the ESAA scale scores were considered more appropriate for investigating the longitudinal trends, and for the sake of comparability and consistency, the ESAA elementary-level scale scores are used throughout Chapter VI.

APPENDIX VI-B

READING AND MATHEMATICS MEAN ACHIEVEMENT GAIN SCORES, BY PRETEST LEVEL: BASIC ELEMENTARY SAMPLE*

		Grade 3		Grade 4		Grade 5	
Outcome	Pretest Level	Treatment	Control	Treatment	Control	Treatment	Control
Reading	1 (High)	35.3 (3)	32.0 (5)	26.5 (4)	22.3 (7)	26.3 (3)	13.8 (6)
	2	30.8 (6)	36.4 (8)	29.9 (8)	24.3 (6)	19.6 (7)	20.3 (4)
	3	46.2 (6)	52.0 (4)	38.6 (5)	35.2 (5)	20.4 (8)	17.3 (9)
	4 (Low)	40.3 (6)	36.3 (4)	49.4 (5)	33.5 (4)	59.7 (3)	30.5 (2)
	Total	38.6 (21)	38.3 (21)	35.7 (22)	27.8 (22)	26.6 (21)	18.1 (21)
Mathematics	1 (High)	58.4 (2)	62.0 (4)	50.0 (3)	35.8 (5)	40.5 (4)	23.0 (6)
	2	58.3 (6)	71.5 (10)	51.2 (6)	42.0 (7)	32.4 (8)	34.0 (5)
	3	60.6 (9)	29.0 (3)	37.6 (8)	38.6 (5)	16.8 (4)	33.1 (7)
	4 (Low)	62.5 (4)	76.8 (4)	55.0 (5)	29.8 (5)	56.8 (5)	36.0 (3)
	Total	61.1 (21)	64.6 (21)	46.9 (22)	37.0 (22)	36.8 (21)	30.8 (21)

*Entries show gain scores, with school sample sizes in parentheses.

APPENDIX VI-C

YEAR THREE ANALYSIS OF SCHOOL CLIMATE OUTCOMES: BASIC ELEMENTARY CROSS-SECTIONAL SAMPLE

Grade Level	Number of Pairs	Group	Treatment by Principal			Teacher-Student Interaction		
			Pretest	Posttest	Gain	Pretest	Posttest	Gain
3	21	Treatment	87.1	84.2	-2.98	70.5	68.9	-1.66
		Control	88.6	86.5	-2.15	72.0	71.2	-0.84
		T-C Difference	-1.5	-2.3	-.83	-1.5	-2.3*	-.82
4	22	Treatment	85.3	82.7	-2.62	71.4	69.5	-1.87
		Control	83.9	83.0	-0.94	69.4	69.0	-0.44
		T-C Difference	1.4	-0.3	-1.68	2.0*	0.5	-1.43
5	21	Treatment	82.4	83.7	1.27	68.1	67.7	-0.42
		Control	82.1	83.0	0.95	68.4	68.5	0.07
		T-C Difference	0.3	0.7	0.32	-0.3	-0.8	-.49

*A statistically significant treatment-control difference ($p \leq 0.05$ level) is present. Positive differences indicate higher treatment scores than control scores, and negative differences indicate higher control scores.

APPENDIX VI-D

YEAR THREE ANALYSIS OF SCHOOL CLIMATE OUTCOMES: BASIC SECONDARY CROSS-SECTIONAL SAMPLE

Grade Level	Number of Pairs	Group	Teacher-Student Interaction			Treatment by Administrators (Principal)			Treatment by Administrators (Counselors)		
			Pretest	Post-test	Gain	Pretest	Post-test	Gain	Pretest	Post-test	Gain
10	14	Treatment	75.5	75.2	-0.3	77.6	80.7	3.1	80.3	83.0	2.7
		Control	74.9	75.7	0.8	75.5	76.1	0.6	82.4	84.2	1.8
		T-C Difference	0.6	-0.5	-1.1	2.1	4.6**	2.5	-2.1	-1.2	0.9
11	14	Treatment	75.4	74.9	-0.5	79.2	81.5	2.3	85.0	84.7	-0.3
		Control	76.8	74.9	-1.9	79.9	78.9	-1.0	83.9	86.0	2.9
		T-C Difference	-1.4	0.0	1.4	-0.7	2.6	3.3	1.1	-1.3	-3.2**
12	13	Treatment	77.5	78.3	0.8	80.3	81.8	1.5	89.2	87.2	-2.0
		Control	77.4	77.5	0.1	81.4	81.2	-0.2	87.6	87.5	-0.1
		T-C Difference	0.1	0.8	0.7	-1.1	0.6	1.7	1.6	-0.3	-1.9

Grade Level	Number of Pairs	Group	Index of Alienation			Perceived School Discrimination*			Student Intergroup Relations*		
			Pretest	Post-test	Gain	Pretest	Post-test	Gain	Pretest	Post-test	Gain
10	14	Treatment	84.5	84.9	0.4	83.4	87.2	3.8	75.6	73.7	-1.9
		Control	83.1	83.7	0.6	85.0	83.7	-1.3	75.9	74.1	-1.8
		T-C Difference	1.4	1.2**	-0.2	-1.6	3.5	5.1	-0.3	-0.[illegible]	-0.1
11	14	Treatment	85.1	84.7	-0.4	85.9	86.5	0.6	70.5	68.8	-1.7
		Control	86.0	85.4	-0.6	87.8	88.0	0.2	71.8	70.1	-1.7
		T-C Difference	-0.9	-0.7	0.2	-1.9	-1.5	0.4	-1.3	-1.3	0.0
12	13	Treatment	86.2	86.8	0.6	84.8	85.2	0.4	69.4	69.3	-0.1
		Control	87.2	87.1	-0.1	89.3	89.6	0.3	69.7	67.1	-2.6
		T-C Difference	-1.0	-0.3	0.7	-4.5**	-4.4	0.1	-0.3	2.2	2.5

*This scale is defined for only seven pairs of schools at each grade level.

**A statistically significant treatment-control difference ($p \leq 0.5$ level) is present. Positive differences indicate higher treatment scores than control scores, and negative differences indicate higher control scores.

APPENDIX VI-E

YEAR THREE ANALYSIS OF SCHOOL CLIMATE OUTCOMES: PILOT ELEMENTARY CROSS-SECTIONAL SAMPLE

Grade Level	Number of Pairs	Group	Treatment by Principal			Teacher-Student Interaction		
			Pretest	Posttest	Gain	Pretest	Posttest	Gain
3	10	Treatment	80.9	78.6	-2.37	69.1	68.9	-0.22
		Control	85.2	84.1	-1.17	70.2	69.5	-0.67
		T-C Difference	-4.3	-5.5*	-1.20	-1.1	-0.6	0.45
4	11	Treatment	80.3	78.5	-1.77	69.6	67.3	-2.38
		Control	83.7	80.6	-3.14	70.5	69.7	-0.87
		T-C Difference	-3.4	-2.1	1.37	-0.9	-2.4*	-1.51
5	13	Treatment	77.6	76.3	-1.32	68.1	67.8	-0.33
		Control	81.0	77.1	-3.91	67.0	68.3	1.29
		T-C Difference	-3.4	-0.8	2.59*	1.1	-0.5	-1.62

*A statistically significant treatment-control difference ($p \leq 0.05$ level) is present. Positive differences indicate higher treatment scores than control scores, and negative differences indicate higher control scores.

APPENDIX VI-F

LONGITUDINAL TREND ANALYSIS METHODS

A simple polynomial model for growth over time was chosen for the longitudinal trend analysis. This model can account for expected linear components of growth, as well as any rate of change in growth (acceleration or deceleration). In order to account for possible complex growth functions, polynomials through the fourth order were initially used. Because the higher-order values proved not to be significantly related to the response model, they were dropped from the analysis.

As the methodology of the longitudinal analysis has been detailed in a separate document,* it will be presented here only in summary. The longitudinal analysis followed the same general experimental paradigm used in the cross-sectional analysis; the major difference was the definition of the outcome variables. In the cross-sectional analysis, the simple gains (or covariate-adjusted posttest scores) within a school year were analyzed in the analysis-of-variance model to determine treatment effects. In the longitudinal analysis, we defined new outcome measures that were functions of the data for all six testing occasions, and analyzed those measures within the same analysis-of-variance model.

The transformations chosen for the outcome variables were simple orthogonal polynomials. This type of transformation was chosen because the resulting time trends would be directly interpretable, and because this transformation would take advantage of the equal time separations of the test administrations. Thus, although the six-month test intervals were not intended or desired, they proved convenient for the time-trend analyses.

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*ESAA Combined Evaluation, Final Study Design: Volume III. System Development Corporation, TM-5236/015/00, February 1977.

APPENDIX IV-F (CONT.)

LONGITUDINAL TREND ANALYSIS METHODS

The orthogonal polynomial transformation method involves multiplying the test score for each occasion by a coefficient, and summing the products to form a single value. Coefficients are chosen to represent various possible trends in the data. The linear coefficients, for example, are equally spaced integers increasing in value from a negative value to a positive value and having a mean of zero. When such coefficients are multiplied by a set of test scores at the ordered time intervals and the products are summed, the resulting data points (i.e., weighted scores) represent the linear slope of the data. A high positive sum indicates that the data points follow a straight line with positive slope, while a high negative value indicates a line with a negative slope.

A separate set of coefficients was chosen for each polynomial trend in the data. In the present analysis, linear, quadratic, cubic, and quartic trends were initially analyzed. Each set of coefficients was chosen to be independent of the others, so that the presence of the quadratic trend could be determined regardless of the presence or absence of a significant linear trend. The achievement outcomes were transformed by orthogonal polynomials for six occasions, and the school climate indices were transformed by orthogonal polynomials for four occasions. Because of the reduced number of occasions available for the school climate data, only second-order trends (linear and quadratic) were used for these data.

APPENDIX VI-G

MEAN SCHOOL CLIMATE SCALE PERFORMANCE: BASIC ELEMENTARY LONGITUDINAL SAMPLE

Outcome	Group	Year Two		Year Three	
		Pretest	Posttest	Pretest	Posttest
Treatment by Principal (TP)	Treatment	82.9	80.1	81.3	81.5
	Control	85.9	85.1	83.5	84.2
Teacher-Student Interaction (TSI)	Treatment	71.1	67.9	68.1	68.1
	Control	68.8	68.3	68.9	68.2

APPENDIX VI-H

MEAN SCHOOL CLIMATE SCALE PERFORMANCE: BASIC SECONDARY LONGITUDINAL SAMPLE

Outcome	Group	Year Two		Year Three	
		Pretest	Posttest	Pretest	Posttest
Teacher-Student Interaction	Treatment	77.1	74.6	76.7	77.6
	Control	78.3	76.7	76.2	75.0
Treatment by Administrators (Principal)	Treatment	82.0	83.9	82.3	85.3
	Control	78.4	80.1	77.9	77.6
Treatment by Administrators (Counselors)	Treatment	88.0	86.2	85.4	81.4
	Control	84.0	81.2	84.4	81.4
Index of Alienation	Treatment	84.7	85.7	85.6	85.7
	Control	84.4	85.5	84.7	86.0
Perceived School Discrimination	Treatment	87.9	90.4	89.3	87.2
	Control	89.1	91.2	89.3	88.4
Student Intergroup Relations	Treatment	69.6	71.1	67.8	66.0
	Control	76.5	70.9	67.9	63.2

APPENDIX VI-J

MEAN SCHOOL CLIMATE SCALE PERFORMANCE: PILOT ELEMENTARY LONGITUDINAL SAMPLE

Outcome	Group	Year Two		Year Three	
		Pretest	Posttest	Pretest	Posttest
Treatment by Principal (TP)	Treatment	78.8	76.7	73.9	71.2
	Control	80.6	78.0	79.6	75.3
Teacher-Student Interaction (TSI)	Treatment	69.5	68.5	67.1	67.2
	Control	69.2	71.2	68.9	69.1

APPENDIX VI-K

BASIC ELEMENTARY SAMPLE: YEAR ONE MEAN TREATMENT EFFECTS FOR LONGITUDINAL AND DROPOUT DISTRICTS*

Grade	Outcome	Longitudinal Districts (N=17)	Dropout Districts (N=18)	Difference in Effect**
3	Reading Vocabulary	-2.67	4.54	-7.21***
	Reading Comprehension	-0.90	3.21	-4.11
	Mathematics Concepts	-3.48	2.31	-5.79
	Mathematics Computation	2.24	2.62	-0.38
4	Reading Vocabulary	0.00	-7.41	7.41
	Reading Comprehension	-1.57	-2.38	0.81
	Mathematics Concepts	-1.46	-5.55	4.09
	Mathematics Computation	-2.72	-1.42	-1.30
5	Reading Vocabulary	-2.63	0.29	-2.92
	Reading Comprehension	0.71	3.13	-2.42
	Mathematics Concepts	-1.89	3.29	-5.18
	Mathematics Computation	1.01	-0.45	1.46

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[*] "Dropout" districts dropped out of the sample before Year Three.

[**] Mean longitudinal district effect minus mean dropout district effect.

[***] T-test on the difference in means is statistically significant ($p \leq .05$).

APPENDIX VII-A

PILOT ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM VARIABLES PREVIOUSLY FOUND RELATED TO ACHIEVEMENT

Variable	Grade 3	Grade 4	Grade 5
TOTAL$		0.159*	
TSPMTL$	0.105*		
RDSPMTL$			
MHSPMTL$		-0.096	
SACTD	-0.115*	-0.149*	-0.077*
EPRATIO			
TFAXPANY			
TFAPSUPP		-0.097*	-0.064
TTAWARM			
TFAFLXBL	-0.122*		
TFASPRD			
TFAISRD			
SLRDTOT	0.122*		
SLMHTOT			
Y3RDAID1			
Y3RDAID2			
Y3RDAID3			
Y3RDAID4	0.095*		
Y3RDAID5			
Y3RDAID6	-0.087		
Y3RDAID7			
Y3RDAID8			
N	941	1046	1219
R^2	0.05	0.04	0.01

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-B

PILOT ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM VARIABLES PREVIOUSLY FOUND RELATED TO ACHIEVEMENT

Variable	Grade 3	Grade 4	Grade 5
SLMHACT1	-0.140*		
SLMHACT2	0.169*	0.180*	
SLMHACT3			
SLMHACT4			
SLMHACT5			
SLMHACT6			-0.069
SLMHACT7		-0.065	
SLMHACT8		-0.087	
SLRDTOT			
SLMHTOT	0.072	0.061	
SLCULTUR		0.087*	
SLESL		-0.066	
SLCOUNSL			
SLABSENT	-0.113*		
ESSXPECT	0.062	0.104*	
ESTSUPP			0.074
ESLTKESC			
ESIELOC	0.064		
ESBELNG			-0.078
N	941	1046	1219
R^2	0.05	0.05	0.025

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-C

BASIC ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM VARIABLES PREVIOUSLY FOUND RELATED TO ACHIEVEMENT

Variable	Grade 3	Grade 4	Grade 5
SLRDACT1	0.099*	- 0.052	
SLRDACT2			
SLRDACT3			
SLRDACT4	-0.073*	-0.077	
SLRDACT5			-0.054
SLRDACT6	-0.074*		
SLRDACT7	0.059		0.067*
SLRDACT8	-0.084*		
SLRDTOT	-0.061		
SLMHTOT	-0.060		
SLCULTUR	0.131*	0.056	
SLESL	0.073		
SLCOUNSL			
SLABSENT			
ESSXPECT			
ESTSUPP			
ESLIKESC			
ESIELOC			
ESBELNG	-0.061	-0.057	-0.075*
N	1638	1736	1793
R^2	0.06	0.02	0.02

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-D

BASIC ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM VARIABLES PREVIOUSLY FOUND RELATED TO ACHIEVEMENT

Variable	Grade 3	Grade 4	Grade 5
SLMHACT1	0.069*		-0.066*
SLMHACT2			
SLMHACT3			
SLMHACT4	-0.189*	-0.051	
SLMHACT5			-0.088*
SLMHACT6			
SLMHACT7			
SLMHACT8			
SLRDTOT	-0.061		
SLMHTOT	0.131*	0.094*	
SLCULTUR			-0.077*
SLESL			0.062
SLCOUNSL			
SLABSENT			
ESSXPECT			0.058
ESTSUPP			
ESLIKESC		0.074	
ESIELOC			
ESBELNG	-0.065*		-0.051
N	1638	1736	1793
R^2	0.05	0.02	0.03

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-E

BASIC SECONDARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM VARIABLES PREVIOUSLY FOUND RELATED TO ACHIEVEMENT

Variable	Grade 10	Grade 11	Grade 12
SLRDACT1		0.119*	
SLRDACT2			
SLRDACT3			
SLRDACT4			
SLRDACT5			
SLRDACT6			
SLRDACT7			
SLRDACT8			-0.089
SLRDTOT			
SLMHTOT	-0.076		
SLCULTUR			
SLESL			
SLCOUNSL			
SLABSENT			
$XPECT		0.077	
SSINSTRT			
SSTLIKES			
SSBELONG		-0.073	
SSICLOC	0.090*	0.089	0.094
N	882	792	483
R^2	0.02	0.04	0.02

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-F

BASIC SECONDARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM VARIABLES PREVIOUSLY FOUND RELATED TO ACHIEVEMENT

Variable	Grade 10	Grade 11	Grade 12
SLMHACT1			
SLMHACT2			
SLMHACT3			
SLMHACT4		-0.132	
SLMHACT5			
SLMHACT6			
SLMHACT7			0.117
SLMHACT8			
SLRDTOT			
SLMHTOT		0.105	
SLCULTUR			
SLESL			
SLCOUNSL			
SLABSENT			
$XPECT			
SSINSTRT		0.102	
SSTLIKES			
SSBELONG			
SSIELOC	0.160*		
N	882	792	483
R^2	0.03	0.05	0.02

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-G

PILOT ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM STUDENT-LEVEL PROGRAM VARIABLES

Variable	Grade 3	Grade 4	Grade 5
SLRDACT1			
SLRDACT2			
SLRDACT3	0.148*		
SLRDACT4			
SLRDACT5	-0.119*	0.111	
SLRDACT6			
SLRDACT7		-0.077	
SLRDACT8		-0.195*	-0.091*
SLRDTOT	0.118*		
SLMHTOT			
SLCULTUR		0.102*	
SLESL		-0.073	
SLCOUNSL			
SLABSENT			
ESSXPECT	0.101*		0.105*
ESTSUPP	0.072		
ESLIKESC			
ESIELOC			0.087*
ESBELNG			0.072
N	941	1046	1219
R^2	0.05	0.04	0.03

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-H

PILOT ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM STUDENT-LEVEL PROGRAM VARIABLES

Variable	Grade 3	Grade 4	Grade 5
SLMHACT1	-0.140*		
SLMHACT2	0.169*	0.180*	
SLMHACT3			
SLMHACT4			
SLMHACT5			
SLMHACT6			-0.069
SLMHACT7		-0.065	
SLMHACT8		-0.087	
SLRDTOT			
SLMHTOT	0.072	0.061	
SLCULTUR		0.087*	
SLESL		-0.066	
SLCOUNSL			
SLABSENT	-0.113*		
ESSXPECT	0.062	0.104*	
ESTSUPP			0.074
ESLIKESC			
ESIELOC	0.064		
ESBELNG			-0.078
N	941	1046	1219
R^2	0.05	0.05	0.025

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-J

BASIC ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM STUDENT-LEVEL PROGRAM VARIABLES

Variable	Grade 3	Grade 4	Grade 5
SLRDACT1	0.099*	-0.052	
SLRDACT2			
SLRDACT3			
SLRDACT4	-0.073*	-0.077	
SLRDACT5			-0.054
SLRDACT6	-0.074*		
SLRDACT7	0.059		0.067*
SLRDACT8	-0.084*		
SLRDTOT	-0.061		
SLMHTOT	-0.060		
SLCULTUR	0.131*	0.056	
SLESL	0.073*		
SLCOUNSL			
SLABSENT			
ESSXPECT			
ESTSUPP			
ESLIKESC			
ESIELOC			
ESBELNG	-0.061	-0.057	-0.075*
N	1638	1736	1793
R^2	0.06	0.02	0.02

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-K

BASIC ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM STUDENT-LEVEL PROGRAM VARIABLES

Variable	Grade 3	Grade 4	Grade 5
SLMHACT1	0.069*		-0.066*
SLMHACT2			
SLMHACT3			
SLMHACT4	-0.189*	-0.051	
SLMHACT5			-0.088*
SLMHACT6			
SLMHACT7			
SLMHACT8			
SLRDTOT	-0.061		
SLMHTOT	0.131*	0.094*	
SLCULTUR			-0.077*
SLESL			0.062
SLCOUNSL			
SLABSENT			
ESSXPECT			0.058
ESTSUPP			
ESLIKESC		0.074	
ESIELOC			
ESBELNG	-0.065*		-0.051
N	1638	1736	1793
R^2	0.05	0.02	0.03

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-L

BASIC SECONDARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM STUDENT-LEVEL PROGRAM VARIABLES

Variable	Grade 10	Grade 11	Grade 12
SLRDACT1		0.119*	
SLRDACT2			
SLRDACT3			
SLRDACT4			
SLRDACT5			
SLRDACT6			
SLRDACT7			
SLRDACT8			-0.089
SLRDTOT			
SLMHTOT	-0.076		
SLCULTUR			
SLESL			
SLCOUNSL			
SLABSENT			
SXPECT		0.077	
SSINSTRT			
SSLIKES			
SSBELNG		-0.073	
SSIELOC	0.090*	0.089	0.094
N	882	792	483
R^2	0.02	0.04	0.02

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-M

BASIC SECONDARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM STUDENT-LEVEL PROGRAM VARIABLES

Variable	Grade 10	Grade 11	Grade 12
SLMHACT1			
SLMHACT2			
SLMHACT1			
SLMHACT2			
SLMHACT3			
SLMHACT4		-0.132	
SLMHACT5			
SLMHACT6			
SLMHACT7			0.117
SLMHACT8			
SLRDTOT			
SLMHTOT		0.105	
SLCULTUR			
SLESL			
SLCOUNSL			
SLALSENT			
$XPECT			
SSINSTRT		0.102	
SSILIKES			
SSBELONG			
SSIELOC	0.160*		
N	882	792	483
R^2	0.03	0.05	0.02

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-N

PILOT ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 3	Grade 4	Grade 5
SLABSENT			
TOTAL$		0.215*	
TSPMTL$			
RDSPMTL$			
MHSPMTL$	0.164*	-0.159	
ENROLL			
SACTD			
TFAXPANY			
TFAPSUPP			
TFAWARM			
TFAFLXBL			
TFASPRD			
TFAISRD			
SLRDTOT	0.177*		
SLMHTOT			
EPRATIO			
ESTWT	0.073		0.066
ESTXPECT	0.158*	0.180*	0.139*
ESTMIXC			
ESTMIXR			
ESTSUPP	0.089*	-0.206*	
ESHHRESR			
ESHHRESM			
Y3RDACT1	-0.158*		
Y3RDACT2			
Y3RDACT3			
Y3RDACT4			
Y3RDACT5			
Y3RDACT6			
Y3RDACT7			
Y3RDACT8			
Y3RDACT9			
Y3RDACTA			
Y3REACTB			

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-N (CONT.)

PILOT ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 3	Grade 4	Grade 5
Y3RDAPH1			
Y3RDAPH2			
Y3RDAPH3			
Y3RDAPH4			
Y3RDAPH5			
Y3RDAPH6			
Y3RDAPH7			
Y3RDAPH8	0.118*		
Y3RDAPH9			
Y3RDAPHX			
Y3RDAC01		-0.112*	-0.095
Y3RDAC02			-0.100*
Y3RDAC03			0.107*
Y3RDAC04	0.167*		
Y3RDAC05			
Y3RDAC06			
Y3RDAD07			
Y3RDAC08	0.144*		
Y3RDAC09			
Y3RDAC10			
Y3RDAC11			0.149*
Y3RDAC12			
Y3RDAC13			
Y3RDAC14	-0.098		
Y3RDAC15			
Y3RDAC16			
Y3RDAC17			
Y3RDAC18			
Y3RDAC19			
Y3RDAC20	-0.096		
Y3RDOACT			
Y3RDLSNP	0.139*	-0.206*	
Y3RDQUIZ		-0.111*	-0.105*
Y3RDFBK1			
Y3RDFBK2			
Y3RDFBK3			
Y3RDFBK4			
Y3RDSPND			

*Beta coefficient is significant at the p < .01 level. (All other coefficients are significant at the p < .05 level.)

APPENDIX VII-N (CONT.)

PILOT ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 3	Grade 4	Grade 5
Y3RDOTXT			
Y3RDAID1			
Y3RDAID2			
Y3RDAID3			
Y3RDAID4			-0.108*
Y3RDAID5			
Y3RDAID6			
Y3RDAID7			
Y3RDAID8			
Y3RDMAT1			
Y3RDMAT2			
Y3RDMAT3			
Y3RDMAT4			
Y3RDMAT5			
Y3RDMAT6			
Y3RDMAT7			
Y3RDMAT8			
Y3RDMAT9	-0.123*		
Y3RDMATA			0.120*
Y3RDMATB		0.096*	
Y3RDMATC			
Y3RDMATD			
Y3RDMATE			
Y3RDMATF			
Y3RDTXBK			
N	789	846	1010
R^2	0.12	0.13	0.12

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-P

PILOT ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 3	Grade 4	Grade 5
SLABSENT			
TOTAL$		0.228*	
TSPMTL$			
RDSMPTL$			
MHSPMTL$	0.219*		0.112*
ENROLL	-0.336*		
SACTD		-0.129	
DMINTCH			
SATTDES			
SDAZESTD	0.233*		
TFAXPANY			
TFAPSUPP			
TFAWARM			
TFAFLXBL			
TFASPMAT			
TFAISMAT		0.067	
SLRDTOT			
SLMHTOT	0.181*	0.128*	
EPRATIO			
ESTWT			
ESTXPECT	0.103*	0.197*	0.094*
ESTMIXC			
ESTMIXR		-0.095*	
ESTSUPP			
ESHHRESR			
ESHHRESM			
ESLIKESC			
ESIELOC			
ESBELNG	-0.079		-0.068
Y3MHMNTH			
Y3MHSIZE			
Y3MHACT1			
Y3MHACT2			
Y3MHACT3			
Y3MHACT4	0.125	0.159*	

*Beta coefficient is significant at the p < .01 level. (All other coefficients are significant at the p < .05 level.)

APPENDIX VII-P (CONT.)

PILOT ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 3	Grade 4	Grade 5
Y3MHACTA			
Y3MHACTB			
Y3MHTXBK			
Y3MHMAC1			
Y3MHMAC2	-0.195*		
Y3MHMAC3			
Y3MHMAC4			
Y3MHMAC5			
Y3MHMAC6			
Y3MHMAC7			
Y3MHMAC8			
Y3MHMAC9			
Y3MHMACA			0.132*
Y3MHMACB			-0.089*
Y3MHMACC		0.083*	
Y3MHMACD			
Y3MHREVU			
Y3MHDRLL			
Y3MHGAME	0.169*		
Y3MHMODL			
Y3MHPLAN			
Y3MHQUIZ			
Y3MHFBK1			
Y3MHFBK2			
Y3MHFBK3			
Y3MHFBK4			
Y3MHSPND			
Y3MHASID1			
Y3MHAID2		-0.099*	
Y3MHAID3			
Y3MHAID4			
Y3MHAID5			
Y3MHAID6			
Y3MHAID7			
Y3MHMAT1			
Y3MHMAT2			
Y3MHMAT3			
Y3MHMAT4			

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-P (CONT.)

PILOT ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 3	Grade 4	Grade 5
Y3MHMAT4	-0.11		
Y3MHMAT5		0.071	
Y3MHMAT6			
Y3MHSHOP			
Y3MHCRLM	0.132		
Y3MHSSMT			
Y3MHJRNL			
Y3MHLIKE			
Y3MHPCWT			
N	789	942	1069
R^2	0.020	0.13	0.06

APPENDIX VII-Q

BASIC ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 3	Grade 4	Grade 5
SLABSENT			
TOTAL$			
TSPMTL$			
RDSPMTL$			
MHSPMTL$			0.054
ENROLL			
SACTD			-0.132*
TFAXPANY			
TFAPSUP			
TFAWARM			
TFAFLXBL			
TFASPRD			
TFAISRD		-0.051	
SLRDTOT			
SLMHTOT	-0.073*		
EPRATIO			
ESTWT	0.063	0.108*	
ESTXPECT	0.114*	0.108*	0.086*
ESTMIXC			
ESTMIXR	0.053		
ESTSUPP	0.102*		
ESHHRESR			0.078*
ESHHRESM			
Y3RDACT1			
Y3RDACT2			
Y3RDACT3			
Y3RDACT4			
Y3RDACT5			
Y3RDACT6			
Y3RDACT7			
Y3RDACT8			
Y3RDACT9			

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-Q (CONT.)

BASIC ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 3	Grade 4	Grade 5
Y3RDACTA			
Y3RDACTB			
Y3RDAPH1			
Y3RDAPH2		-0.067	
Y3RDAPH3			
Y3RDAPH4			
Y3RDAPH5			
Y3RDAPH6	-0.067		
Y3RDAPH7	0.145*		
Y3RDAPH8	0.148*		-0.069
Y3RDAPH9	0.071		
Y3RDAPHX	-0.151*		
Y3RDAC01			
Y3RDAC02			
Y3RDAC03			
Y3RDAC04			
Y3RDAC05	0.123*		
Y3RDAC06			
Y3RDAC07	-0.181*		
Y3RDAC08	0.112*		
Y3RDAC09			
Y3RDAC10	-0.119*		
Y3RDAC11			
Y3RDAC12	-0.083*		
Y3RDAC13			
Y3RDAC14		0.077*	
Y3RDAC15			
Y3RDAC16			
Y3RDAC17			
Y3RDAC18			
Y3RDAC19			
Y3RDAC20		-0.073	
Y3RDOACT			
Y3RDLSNP			
Y3RDQUIZ			
Y3RDFBK1	0.117*		
Y3RDFBK2			
Y3RDFBK3			

*Beta coefficient is significant at the p < .01 level. (All other coefficients are significant at the p < .05 level.)

APPENDIX VII-Q (CONT.)

BASIC ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 3	Grade 4	Grade 5
Y3RDFBK4			
Y3RDSPND			-0.070*
Y3RDOTXT	-0.091*		
Y3RDAID1			
Y3RDAID2	0.116*		
Y3RDAID3		-0.061	
Y3RDAID4			
Y3RDAID5	-0.104*	-0.061	
Y3RDAID6			
Y3RDAID7			
Y3RDAID8	-0.075		
Y3RDMAT1	-0.057		
Y3RDMAT2	0.062		
Y3RDMAT3		-0.079*	
Y3RDMAT4			
Y3RDMAT5			
Y3RDMAT6			
Y3RDMAT7			
Y3RDMAT8			
Y3RDMAT9			
Y3RDMATA			
Y3RDMATB			
Y3RDMATC			
Y3RDAMTD			
Y3RDAMTE		0.085*	
Y3RDAMTF			0.075*
N	1464	1584	1506
R^2	0.15	0.08	0.06

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-R

BASIC ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 3	Grade 4	Grade 5
SLABSENT			
TOTAL$	-0.166*		
TSPMTL$			
RDSPMTL$			
MHSPMTL$		0.055	
ENROLL			
SACTD			
DMINTCH		-0.074*	
SATTDES			
SDAZESTD			
TFAXPANY			
TFAPSUPP			
TFAWARM	-0.071		0.063
TFAFLXBL			
TFASPMAT			-0.060
TFAISMAT			-0.060
SLRDTOT			
SLHMTOT		0.095*	-0.082*
EPRATIO			-0.053
ESTWT			
ESTXPECT	0.123*	0.085*	0.104*
ESTMIXC	0.100#		
ESTMIXR			
ESTSUPP	0.141*		0.062*
ESHHRESR			
ESHHRESM			
ESLIKESC		0.071*	
ESIELOC	0.068		
ESBELNG			
Y3MHMNTH			0.060
Y3MHSIZE			
Y3MHACT1	0.142*	-0.071*	
Y3MHACT2			
Y3MHACT3			
Y3MHACT4		0.085*	
Y3MHACT5			
Y3MHMAC6		-0.071*	

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-R (CONT.)

BASIC ELEMENTARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 3	Grade 4	Grade 5
Y3MHMAC7			
Y3MHMAC8		0.093*	
Y3MHMAC9			
Y3MHMACA			-0.[illegible]
Y3MHMACB	-0.077		
Y3MHMACC			
Y3MHMACD			
Y3MHREVU	-0.081*		
Y3MHDRLL			
Y3MHGAME			
Y3MHMODL		-0.071*	
Y3MHPLAN			
Y3MHQUIZ			
Y3MHFBK1			
Y3MHFBK2	-0.074		
Y3MHFBK3			
Y3MHFBK4			
Y3MHSPND			
Y3MHAID1			
Y3MHAID2			
Y3MHAID3			
Y3MHAID4			
Y3MHAID5			
Y3MHAID6	-0.083#		
Y3MHAID7			
Y3MHMAT1	0.118*		-0.090*
Y3MHMAT2			
Y3MHMAT3			
Y3MHMAT4			
Y3MHMAT5			
Y3MHMAT6			
Y3MHSHOP			
Y3MHCRLM			
Y3MHSSMT			
Y3MHJRNL			
Y3MHLIKE			
Y3MHPCWT			
N	1396	1612	1675
R^2	0.12	0.07	0.07

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-S

BASIC SECONDARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 10	Grade 11	Grade 12
SLABSENT			
SLOTHERS			
TOTAL$		0.122*	
TSPMTL$			
RDSPMTL$			
MHSPMTL$			
ENROLL			
PPCTITL1			
PRATIO			
SACTD			0.164
TFAXPANY			0.172*
TFAPSUPP			
TFAWARM	-0.084		
TFAFLXBL			
TFASPMAT			
TFAISMAT			
SLRDTOT			
SLMHTOT	-0.100		
SSTWT			
SSTXPECT			
Y3RDACT1			
Y3RDACT2			
Y3RDACT3			
Y3RDACT4			
Y3RDACT5			
Y3RDACT6			
Y3RDACT7	-0.101		
Y3RDACT8			
Y3RDACT9			
Y3RDACTA			
Y3RDACTB	0.161*		
Y3RDTXBK			
Y3RDAFH1			0.137
Y3RDAPH2	0.111		

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-S (CONT.)

BASIC SECONDARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 10	Grade 11	Grade 12
Y3RDAPH3			
Y3RDAPH4			
Y3RDAPH5			
Y3RDAPH6			
Y3RDAPH7			
Y3RDAPH8		-0.107	
Y3RDAPH9			
Y3RDAPHX			
Y3RDAC01			
Y3RDAC02			
Y3RDAC03			
Y3RDAC04			
Y3RDAC05			
Y3RDAC06			
Y3RDAC07			
Y3RDAC08			
Y3RDAC09		0.088	
Y3RDAC10			
Y3RDAC11			
Y3RDAC12			
Y3RDAC13			
Y3RDAC14			
Y3RDAC15	0.098		
Y3RDAC16			
Y3RDAC17			
Y3RDAC18			
Y3RDAC19			
Y3RDAC20			
Y3RDOACT			
Y3RDLSNP			
Y3RDQUIZ	0.113*		
Y3RDFBK1			
Y3RDFBK2			
Y3RDFBK3			
Y3RDFBK4	0.129*		
Y3RDSPND			
Y3RDOTXT			
Y3RDAID1			

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-S (CONT.)

BASIC SECONDARY SAMPLE: REGRESSION STATISTICS FOR READING OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 10	Grade 11	Grade 12
Y3RDAID2			
Y3RDAID3			
Y3RDAID4	-0.100		
Y3RDAID5			
Y3RDAID6			
Y3RDAID7			
Y3RDAID8			
Y3RDMAT1			
Y3RDMAT2			
Y3RDMAT3			
Y3RDMAT4			
Y3RDMAT5	-0.178*		
Y3RDMAT6			
Y3RDMAT7			-0.127
Y3RDMAT8			
Y3RDMAT9			
Y3RDMATA			
Y3RDMATB			
Y3RDMATC			
Y3RDMATD			
Y3RDMATE			-0.195*
Y3RDMATF			
N	620	545	286
R^2	0.10	0.05	0.12

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-T

BASIC SECONDARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 10	Grade 11	Grade 12
SLABSENT			
SLTOTHRS			
TOTAL$		0.111	
TSPMTL$			
RDSPMTL$			
MHSPMTL$			
ENROLL			
PPCTITL1			
PRATIO			
SACTD			
DMINTCH			
SATIDES			
SDAZESTD			
SDAZHSTD			
TFAXPANY			
TFAPSUPP			
TFAWARM			
TFAFLXBL			
TFASPMAT			
TFAISMAT			
SLRDTOT			
SLMHTOT		0.091	
SSTWT			
SSTXPECT		0.134*	
SSHHRESR			
SSHHRESM			
SSTLIKES			
SSIELOC	0.162*		
SSBELONG			
Y3MHMNTH			
Y3MHSIZE			
Y3MHACT1			
Y3MHACT2			
Y3MHACT3			

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-T (CONT.)

BASIC SECONDARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 10	Grade 11	Grade 12
Y3MHACT4			
Y3MHACT4			
Y3MHACT5			
Y3MHACT6			
Y3MHACT7			
Y3MHACT8	0.097*		
Y3MHACT9		0.189*	
Y3MHACTA			
Y3MHACTB		-0.337*	
Y3MHTXBK			
Y3MHMAC1			
Y3MHMAC2			
Y3MHMAC3	-0.089		
Y3MHMAC4			
Y3MHMAC5			
Y3MHMAC6			
Y3MHMAC7	0.085		
Y3MHMAC8			
Y3MHMAC9			
Y3MHMACA			
Y3MHMACC			-0.135
Y3MHMACD			
Y3MHREVU			
Y3MHDRLL			
Y3MHGAME			
Y3MHMODL			
Y3MHPLAN			
Y3MHQUIZ			
Y3MHFBK1			
Y3MHFBK2			
Y3MHFBK3			
Y3MHFBK4			
Y3MHSPND			
Y3MHAID1			
Y3MHAID2			
Y3MHAID3			
Y3MHAID4	0.138*		
Y3MHAID5			
Y3MHAID6	-0.099		

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-T (CONT.)

BASIC SECONDARY SAMPLE: REGRESSION STATISTICS FOR MATHEMATICS OUTCOMES PREDICTED FROM NEW TEACHER VARIABLES

Variable	Grade 10	Grade 11	Grade 12
Y3MHAID7			
Y3MHMAT1			
Y3MHMAT2			
Y3MHMAT3			
Y3MHMAT4			
Y3MHMAT5			
Y3MHMAT6			
Y3MHSHOP			
Y3MHCRLM			
Y3MHSSMT			
Y3MHJRNL			
Y3MHLIKE			
Y3MHPCWT			
N	762	517	296
R^2	0.07	0.08	0.09

*Beta coefficient is significant at the $p < .01$ level. (All other coefficients are significant at the $p < .05$ level.)

APPENDIX VII-U

IDENTIFICATION OF VARIABLES FOR ANALYSES BASED ON PREVIOUSLY SUCCESSFUL PREDICTORS

Level	Variable	Indicator Type	Attribute/Dimension	Comments
School	TOTAL$	Composite	Total per-pupil expenditures for school	
	TOTAL$	Composite	Total supplemental per-pupil expenditures for school	
	RDSPMTL$	Composite	Supplemental per-pupil expenditures for reading instruction	
	MHSPMTL$	Composite	Supplemental per-pupil expenditures for mathematics instruction	
	SACTD	Composite	Extent of desegregation-complementary activities	Composite indicated frequency of district activities before and during desegregation, such as media presentations, public meetings, contingency plans in case of interracial tension, and staff meetings.
	PRATIO	Single-Item	Teacher-student ratio for school	
Teacher	TFAXPANY	Single-Item	Teaching experience in any school	
	TFAWARM	Single-Item	Teaching style in motivating student	Categories were rank-ordered so that "high" reflected establishing a warm, accepting climate for children, and "low" indicated rewarding specific academic/social behaviors.
	TFAFLXBL	Single-Item	Teaching philosophy	Categories were rank-ordered so that "high" reflected a flexible teaching approach, and "low" indicated a structured approach.

APPENDIX VII-U (CONT.)

IDENTIFICATION OF VARIABLES FOR ANALYSES BASED ON PREVIOUSLY SUCCESSFUL PREDICTORS

Level	Variable	Indicator Type	Attribute/Dimension	Comments
Teacher (cont.)	TFASPRD	Single-Item	Inservice training in reading	Variable was dichotomized: inservice training or no inservice training.
	TFAISRD	Single-Item	Recency of special training in reading	
	TFASPMAT	Single-Item	Inservice training in mathematics	Variable was dichotomized: inservice training or no inservice training.
	TFAISMAT	Single-Item	Recency of special training in mathematics	
	TFAPSUPP	Single-Item	Teacher's report of the degree of principal support of instructional staff	
Reading Program	Y3RDAID1	Single-Item	Extent of use of remedial reading teacher or reading specialist	
	Y3RDAID2	Single-Item	Extent of use of paraprofessional or teacher aide	
	Y3RDAID3	Single-Item	Extent of use of speech therapist	
	Y3RDAID4	Single-Item	Extent of use of student teachers (practice teaching)	
	Y3RDAID5	Single-Item	Extent of use of student tutors	
	Y3RDAID6	Single-Item	Extent of use of counselor or psychologist to assist in reading instruction	

APPENDIX VII-U (CONT.)

IDENTIFICATION OF VARIABLES FOR ANALYSES BASED ON PREVIOUSLY SUCCESSFUL PREDICTORS

Level	Variable	Indicator Type	Attribute/Dimension	Comments
Reading Program (cont.)	Y3RDAID7	Single-Item	Extent of use of parent or other adult volunteer to assist in reading instruction	
	Y3RDAID8	Single-Item	Extent of use of media specialist to assist in reading instruction	
Mathematics Program	Y3MHAID1	Single-Item	Extent of use of remedial math teacher or math specialist	
	Y3MHAID2	Single-Item	Extent of use of paid paraprofessional or teacher aide	
	Y3MHAID3	Single-Item	Extent of use of student teacher (practice teaching) in mathematics instruction	
	Y3MHAID4	Single-Item	Extent of student tutors in mathematics instruction	
	Y3MHAID5	Single-Item	Extent of use of counselor or psychologist to assist in mathematics instruction	
	Y3MHAID6	Single-Item	Extent of use of parent or other adult volunteer to assist in mathematics instruction	
	Y3MHAID7	Single-Item	Extent of use of media specialist to assist in mathematics instruction	

APPENDIX VII-W

IDENTIFICATION OF VARIABLES FOR ANALYSES BASED ON STUDENT-LEVEL PROGRAM VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Reading Program	SLRDTOT	Composite	Hours of reading instruction per week	Average of monthly attendance log reports
			Proportion of weekly reading instruction devoted to working with:	
	SLRDACT1	Composite	Adult as part of entire class	Each composite is the average of the proportions indicated in the monthly attendance log reports.
	SLRDACT2	Composite	Adult in group of 12 or more but less than full class	
	SLRDACT3	Composite	Adult in group of 7 to 11 students	
	SLRDACT4	Composite	Adult in group of 2 to 6 students	
	SLRDACT5	Composite	Adult on a one-to-one basis	
	SLRDACT6	Composite	Student tutor on a one-to-one basis	
	SLRDACT7	Composite	Student works independently	
	SLRDACT8		Student leaves regular reading classroom to attend a "pullout" reading activity	
Mathematics Program	SLMHTOT	Composite	Hours of mathematics instruction per week	Average of monthly attendance log reports
			Proportion of weekly mathematics instruction devoted to working with:	
	SLMHACT1	Composite	Adult as part of entire class	Each composite is the average of the proportions indicated in the monthly attendance log reports.
	SLMHACT2	Composite	Adult in group 12 or more but less than full class	
	SLMHACT3	Composite	Adult in group of 7 to 11 students	
	SLMHACT4	Composite	Adult in group of 2 to 6 students	

APPENDIX VII-W (CONT.)

IDENTIFICATION OF VARIABLES FOR ANALYSES BASED ON STUDENT-LEVEL PROGRAM VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Mathematics Program (cont.)	SLMHACT5	Composite	Adult on a one-to-one basis	
	SLMHACT6	Composite	Student tutor on a one-to-one basis	
	SLMHACT7	Composite	Student works independently	
	SLMHACT8	Composite	Student leaves regular mathematics classroom to attend a "pullout" mathematics activity	
Other Instructional Characteristics	SLRDTOT	Composite	Total hours of reading activities per week	Estimated with the mean value from available monthly attendance log reports
	SLMHTOT	Composite	Total hours of mathematics activities per week	
	SLCULTUR	Composite	Instruction centering on the culture of minority groups	
	SLESL	Composite	English as a second language or bilingual activities	
	SLCOUNSL	Composite	Individual counseling/guidance related to academic performance	
	SLABSENT	Composite	Estimated days absent from school	
Student Characteristics*	ESTXPCT (SXPECT)	Single-Item	Teacher's educational expectations for students	
	ESIELOC (SSIELOC)	Composite	Internal-external locus of control	Composite indicates the extent of internal orientation toward traditional locus-of-control items

*Upper variable in each cell is the elementary-student variable; lower variable, in parentheses, is the secondary student variable.

APPENDIX VII-W (CONT.)

IDENTIFICATION OF VARIABLES FOR ANALYSES BASED ON STUDENT-LEVEL PROGRAM VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Student Characteristics* (cont.)	ESBELNG (SSBELONG)	Single-Item	Student belonging in school	Variable was dichotomized as belonging or not belonging.
	ESLIKES (SSTLIKES)	Single-Item	Student liking for school	Variable was dichotomized as liking or not liking.
	ESTSUPP (SSINSTRT)	Composite	Student's perception of the support he/she receives from teacher	Composite of four items reflecting student view of the student-teacher interactions.

*Upper variable in each cell is the elementary-student variable; lower variable, in parentheses, is the secondary-student variable.

APPENDIX VII-Y

IDENTIFICATION OF NEW TEACHER VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Organization of Reading Classes	Y3RDACT1	Single-Item	Whole-class instruction by classroom teacher	Average number of minutes typically spent in the activity
	Y3RDACT2	Single-Item	Small group taught by classroom teacher	
	Y3RDACT3	Single-Item	Individual instruction by classroom teacher	
	Y3RDACT4	Single-Item	Small group taught by a remedial reading teacher or specialist	
	Y3RDACT5	Single-Item	Small group taught by an aide or volunteer	
	Y3RDACT6	Single-Item	Individual tutoring by an adult	
	Y3RDACT7	Single-Item	Individual tutoring by another student	
	Y3RDACT8	Single-Item	Individual use of published self-instructional materials or programmed texts	
	Y3RDACT9	Single-Item	Independent seatwork, e.g., using ditto sheets, workbooks, etc.	
	Y3RDACTA	Single-Item	Independent use of learning/interest centers	
	Y3RDACTB	Single-Item	Testing and evaluation	

APPENDIX VII-Y (CONT.)

IDENTIFICATION OF NEW TEACHER VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Reading instructional activities	Y3RDAC01	Single-Item	Identifying and practicing letter-sound correspondences	Relative frequency of each type of activity for the typical student
	Y3RDAC02	Single-Item	Reviewing letter-sound relationships	
	Y3RDAC03	Single-Item	Identifying letters or groups of letters	
	Y3RDAC04	Single-Item	Writing letters or groups of letters	
	Y3RDAC05	Single-Item	Blending the sounds letters stand for into words	
	Y3RDAC06	Single-Item	Learning new sight words	
	Y3RDAC07	Single-Item	Reviewing basic sight words	
	Y3RDAC08	Single-Item	Studying previxes and suffixes	
	Y3RDAC09	Single-Item	Dividing words into syllables	
	Y3RDAC10	Single-Item	Using context clues to gain meaning	
	Y3RDAC11	Single-Item	Answering questions on comprehension	
	Y3RDAC12	Single-Item	Improving reading rate by using timed readings	
	Y3RDAC13	Single-Item	Answering comprehension questions on timed readings	

APPENDIX VII-Y (CONT.)

IDENTIFICATION OF NEW TEACHER VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Reading instructional activities (cont.)	Y3RDAC14	Single-Item	Dictating part or all of an original story	Relative frequency of each type of activity for the typical student
	Y3RDAC15	Single-Item	Writing stories	
	Y3RDAC16	Single-Item	Reading stories created by self or other students	
	Y3RDAC17	Single-Item	Reading texts orally	
	Y3RDAC18	Single-Item	Alphabetizing	
	Y3RDAC19	Single-Item	Using reference materials such as dictionaries and encyclopedias	
	Y3RDAC20	Single-Item	Taking tests and quizzes	
Materials Used in Reading Instruction	Y3DMAT1	Single-Item	Supplementary readers	Frequency of use of each type of material(s)
	Y3RDMAT2	Single-Item	"Free-reading" books	
	Y3RDMAT3	Single-Item	Programmed reading texts	
	Y3RDMAT4	Single-Item	Tapes or records to which students listen and respond	
	Y3RDMAT5	Single-Item	Workbooks	
	Y3RDMAT6	Single-Item	Duplicating masters	

APPENDIX VII-Y (CONT.)

IDENTIFICATION OF NEW TEACHER VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Materials Used in Reading Instruction (cont.)	Y3RDMAT7	Single-Item	Instructional exercises created by teacher	Frequency of use of each type of material(s)
	Y3RDMAT8	Single-Item	Films or filmstrips	
	Y3RDMAT9	Single-Item	Stories that teacher reads to the students	
	Y3RDMATA	Single-Item	Plays that the students read aloud and/or perform	
	Y3RDMATB	Single-Item	Stories or skill lessons shown on a reading machine	
	Y3RDMATC	Single-Item	Newspapers and magazines	
	Y3RDMATD	Single-Item	Games and puzzles that can be used for practice in recognizing or forming words	
	Y3RDMATE	Single-Item	Kits or sets from educational publishers	
	Y3RDNATF	Single-Item	Reference materials (e.g., dictionaries, encyclopedias)	
Additional Personnel for Reading Instruction	Y3RDAID1	Single-Item	Remedial reading teacher or reading specialist	Availability in hours per week
	Y3RDAID2	Single-Item	Paid paraprofessional or teacher aide	
	Y3RDAID3	Single-Item	Speech therapist	

APPENDIX VII-Y (CONT.)

IDENTIFICATION OF NEW TEACHER VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Additional Personnel for Reading Instruction (cont.)	Y3RDAID4	Single-Item	Student teacher (practice teaching)	Availability in hours per week
	Y3RDAID5	Single-Item	Student tutor	
	Y3RDAID6	Single-Item	Counselor, psychologist	Availability in hours per month
	Y3RDAID7	Single-Item	Parent or other adult volunteer	
	Y3RDAID8	Single-Item	Media specialist	
Type of Student Feedback on Reading Progress	Y3RDFBK1	Single-Item	A letter grade	Frequency of use of each type of feedback to student
	Y3RDFBK2	Single-Item	A number grade	
	Y3RDFBK3	Single-Item	Information about particular strengths	
	Y3RDFBK4	Single-Item	Information about particular weaknesses	
Approach to Reading Instruction	Y3RDAPH1	Single-Item	Uses graded reading series based on frequently occurring words	Trichotomized to indicate if used as 1) major approach, 2) minor approach, or (3) not used
	Y3RDAPH2	Single-Item	Uses graded reading series based on words that are regularly misspelled	
	Y3RDAPH3	Single-Item	Uses graded reading series based on vocabularly stressing letter-sound relationships	

APPENDIX VII-Y (CONT.)

IDENTIFICATION OF NEW TEACHER VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Approach to Reading Instruction (cont.)	Y3RDAPH4	Single-Item	Self-instructional approach dividing materials into small steps	
	Y3RDAPH5	Single-Item	Students select own reading materials primarily through teacher-student conference	
	Y3RDAPH6	Single-Item	Modified alphabetic system	
	Y3RDAPH7	Single-Item	Students read their own "stories"	
	Y3RDAPH8	Single-Item	Reading in content fields	
	Y3RDAPH9	Single-Item	Uses reading series to teach both literal comprehension and implied meanings	
	Y3RDAPHX	Single-Item	Stresses literature and literary appreciation	
	Y3RDTXBT	Single-Item	Extent to which instruction based on a given textbook	
	Y3RDOTXT	Single-Item	Reading level of texts students use in other subject areas	
	Y3RDOTXT	Single-Item	Time spent per day in instruction on reading-related areas (vocabulary, writing, etc.)	
	Y3RDQUIZ	Single-Item	Frequency of reading tests or quizzes	

APPENDIX VII-Y (CONT.)

IDENTIFICATION OF NEW TEACHER VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Approach to Reading Instruction (cont.)	Y3RDLSNP	Single-Item	Extent to which instruction is based on detailed lesson plans	
	Y3RDSPND	Single-Item	Extent to which reading instruction is tailored to the needs of the individual student	
Organization of Mathematics Classes	Y3RDACT1	Single-Item	Whole-class instruction by classroom teacher	Average number of minutes typically spent in the activity
	Y3RDACT2	Single-Item	Small group taught by classroom teacher	
	Y3RDACT3	Single-Item	Individual instruction by classroom teacher	
	Y3RDACT4	Single-Item	Small group taught by a remedial math teacher or specialist	
	Y3RDACT5	Single-Item	Small group taught by an aide or volunteer	
	Y3RDACT6	Single-Item	Individual tutoring by an adult	
	Y3RDACT7	Single-Item	Individual tutoring by another student	
	Y3RDACT8	Single-Item	Individual use of published self-instructional materials or programmed texts	

APPENDIX VII-Y (CONT.)

IDENTIFICATION OF NEW TEACHER VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Organization of Mathematics Classes (cont.)	Y3RDACT9	Single-Item	Independent seatwork, e.g., ditto sheets, workbooks, etc.	
	Y3RDACTA	Single-Item	Independent use of learning/interest centers	
	Y3RDACTB	Single-Item	Testing and evaluation	
Mathematics Instructional Activities	Y3MHMAC1	Single-Item	Learning math vocabulary	Relative frequency of each type of activity for the typical student
	Y3MNMAC2	Single-Item	Solving word problems	
	Y3MHMAC3	Single-Item	Learning symbols	
	Y3MHMAC4	Single-Item	Learning properties and axioms	
	Y3MHMAC5	Single-Item	Learning about number sentences	
	Y3MHMAC6	Single-Item	Learning about sets	
	Y3MHMAC7	Single-Item	Learning geometric concepts	
	Y3MHMAC8	Single-Item	Learning about measurement	
	Y3MHMAC9	Single-Item	Learning about number theory (primes, factors, etc.)	
	Y3MHMACA	Single-Item	Learning about fundamental operations	

APPENDIX VII-Y (CONT.)

IDENTIFICATION OF NEW TEACHER VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Mathematics Instructional Activities	Y3MHMACB	Single-Item	Learning about the structure of number systems	
	Y3MHMACC	Single-Item	Learning about the history of mathematics	
	Y3MHMACD	Single-Item	Drilling on computation	
Additional Personnel for Mathematics Instruction	Y3MHAID1	Single-Item	Remedial math teacher or math specialist	Availability in hours per week
	Y3MHAID2	Single-Item	Paid paraprofessional or teacher aide	
	Y3MHAID3	Single-Item	Student teacher (practice teaching)	
	Y3MHAID4	Single-Item	Student tutor	Availability in hours per month
	Y3MHAID5	Single-Item	Counselor, psychologist	
	Y3MHAID6	Single-Item	Parent or other adult volunteer	
	Y3MHAID7	Single-Item	Media specialist	
	Y3MHFBK1	Single-Item	A letter grade	Frequency of use of each type of feedback
	Y3MHFBK2	Single-Item	A number grade	
	Y3MHFBK3	Single-Item	Information about particular strengths	
	Y3MHFBK4	Single-Item	Information about particular weaknesses	

APPENDIX VII-Y (CONT.)

IDENTIFICATION OF NEW TEACHER VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Materials Used in Mathematics Instruction	Y3MHMAT1	Single-Item	Textbook	Frequency of use of each type of material
	Y3MHMAT2	Single-Item	Workbook	
	Y3MHMAT3	Single-Item	Ditto sheets from commerical duplicator book	
	Y3MHMAT4	Single-Item	Teacher-made ditto sheets	
	Y3MHMAT5	Single-Item	Manipulative devices and aids	
	Y3MHMAT6	Single-Item	Electronic calculators	
	Y3MHTXBX	Single-Item	Extent to which math instruction is based on a given textbook	
	Y3MHREVU	Single-Item	Frequency of review of computational skills	
	Y3MHDRLL	Single-Item	Amount of time devoted to drill versus concept development	
	Y3MHGAME	Single-Item	Frequency of use of games and puzzles in instruction	
	Y3MHMODL	Single-Item	Frequency of use of physical models to teach math concepts	
	Y3MHPLAN	Single-Item	Degree to which instruction is based on a detailed lesson plan	

APPENDIX VII-Y (CONT.)

IDENTIFICATION OF NEW TEACHER VARIABLES

Aspect	Variable	Indicator Type	Attribute/Dimension	Comments
Materials Used in Mathematics Instruction (cont.)	Y3MHQUIZ	Single-Item	Frequency of tests or quizzes	
	Y3MHSPND	Single-Item	Extent to which math instruction is tailored to specific needs of students	
	Y3MHJRNL	Single-Item	Frequency of reading basic math teacher journals	
	Y3MHLIKE	Single-Item	Degree of satisfaction derived from teaching mathematics	
	Y3MHPCWT	Single-Item	Percent of non-minority students in math classroom	

APPENDIX VII-Z

EXPENDITURE CATEGORIES USED IN CRITICAL MASS ANALYSES

Type of Expenditure	Range		
	Low	Middle	High
ESAA Per-Pupil	$ 120 or less	$120.01-$269.99	$ 270 or more
Total Supplemental Per-Pupil	$ 250 or less	$250.01-$374.99	$ 375 or more
Regular Per-Pupil	$ 900 or less	$ 900.01-$1199.99	$1200 or more
Total Per-Pupil	$1100 or less	$1100.01-$1399.99	$1400 or more

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